SENSITIVE PLANT SPECIES SURVEYS

BUTTE DISTRICT, BEAVERHEAD AND MADISON COUNTIES, MONTANA

BUREAU OF LAND MANAGEMENT

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EXECUTIVE SUMMARY

Systematic sensitive plant species surveys were conducted in three study areas on lands administered by the Bureau of Land Management (BLM) in the Butte District, primarily in the Dillon Resource Area. A total of thirteen sensitive species were documented in 46 new occurrences. The acquired new information rounds out the sensitive species resource baseline in the Dillon Resource Area, as highlighted below:

Relative abundance was documented for two watch species that are relatively common in the Big Hole and Grasshopper study areas, respectively: *Astragalus platytropis* and *Townsendia nuttallii*

Significant new information was collected for two species, *Kochia americana* and *Oryzopsis contracta*, which were virtually unknown in Montana before this study and unknown from BLM lands.

Significant new information was collected for six sensitive species, two of which are recommended for change to watch designation. Largest known populations of the following geographically restricted or globally rare sensitive species were documented, shedding light on the habitat requirements and complementary management actions in the Grasshopper Study Area: *Astragalus scaphoides*, *Astragalus terminalis*, *Lesquerella pulchella*, and *Lomatium attenuatum*. Largest known populations of the peripheral species *Stephanomeria spinosa* were also found in the Upper Madison Valley Study Area.

Information was collected for *Erigeron linearis, Lesquerella pulchella,* and *Lomatium attenuatum* at new population or subpopulation sites from settings of human-caused disturbance, shedding light on habitat requirements and effects of disturbance.

Finally, additional distribution information was collected on species that were once considered as State Species of Special Concern, including some which remain on the Watch List because of their limited distribution.

This work documents the sensitive species that are present in each of the study areas in order to determine species status and management needs and to develop all levels of management plans on BLM lands in and adjoining these areas.

ACKNOWLEDGEMENTS

We thank the following Bureau of Land Management professionals for their interest and helpful discussions including Don Heinze, Sandy Brooks, Brian Hockett, and Sally Sovey. Information provided by Walter Fertig of the Wyoming Natural Diversity Database greatly aided in reviewing rangewide species' status. Use of the herbaria at Montana State University and the University of Montana is gratefully acknowledged. The GIS maps were produced by Cedron Jones. Data processing and report production assistance or encouragement were gratiously provided by Katharine Jurist, Debbie Dover, Margaret Beer and Cedron Jones.

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INTRODUCTION

Sensitive species surveys were conducted at the landscape level in three areas on the Butte District of the Bureau of Land Management (BLM) in Beaverhead, Madison and Silver Bow counties, Montana. A fourth area of the Dillon Resource Area was surveyed in concert with this study but reported separately (Lesica and Vanderhorst 1995).

The primary purpose of the study was to fill critical gaps in the Dillon Resource Area botanical baseline by targeting key landscape areas and sensitive species targets that had not yet been systematically addressed. This study should provide a framework for determining which species are truly sensitive, the habitat requirements of those species, and initial management considerations. Priority was placed on locating and evaluating those vascular plant species considered for designation as sensitive by the Montana State Office of the Bureau of Land Management (Bureau of Land Management 1995). An ancillary purpose was to collect information on and to review the status of other Montana State Plant Species of Special Concern that may warrant consideration by the BLM as being sensitive (Heidel 1995).

Sensitive species provide potential pharmaceutical, agricultural and genetic resources. They are also indicators of special habitats and habitat conditions, thereby augmenting the understanding and capacity to manage the landscape and its processes. Safeguarding vulnerable members of the flora and fauna is instrumental in maintaining the complement of native species that are adapted to southwestern Montana, as well as in maintaining the ecosystems to which they belong.

This work does not represent exhaustive documentation of all sensitive plant locations, but does consist of systematic searches to document the full complement of sensitive species in the study areas. It builds upon the body of information garnered from botanical surveys for the BLM to determine the status of rare plant species in the Butte District, to identify conservation priorities, to integrate the practices and benefits of sensitive species management in Bureau planning and operations (Willoughby et al. 1992), and to provide a baseline for reference at all levels of District planning and operations, from that of the individual project to those which span the District or Resource Area.

STUDY AREAS

This study was designed to fill major geographic gaps in the picture of botanical diversity at the south end of the Butte District, with particular emphasis on the Dillon Resource Area. The three study areas were identified using available biological information and also by consultation with Bureau of Land Management personnel in the Dillon and Headwaters Resource Areas. These areas had not previously been systematically surveyed for sensitive plant species but were considered as having high potential for sensitive plant species. Areas include: the Big Hole Study Area west of Twin Bridges, the Grasshopper Study Area west of Dillon, and the Upper Madison Valley study area south of Ennis (Figure 1). A fourth area around Sage Creek was surveyed during the same time and reported separately (Lesica and Vanderhorst 1995). All areas are located mainly within Beaverhead County, but also to a lesser extent in Madison County and in a corner of Silver Bow County.

The three BLM study areas treated in this report are in low elevation settings of intermontane valleys or foothills, and they constitute the largest share of public land in these settings. They are administered not as discrete management units but as allotments and other project units. The names used to refer to the separate study areas are strictly for the purpose of distinguishing them in this report.

Climate of all three areas is semi-arid. The closest weather stations are in Dillon at 5218 ft., and in Ennis at 4953 ft. Mean monthly temperatures in Dillon for January and July are 20.2° F and 66.4° F, respectively; mean annual precipitation is 9.6 inches (NOAA 1982). Mean monthly temperatures in Ennis for January and July are 22.6° F and 64.7° F, respectively; mean annual precipitation is 11.5 inches (NOAA 1982). At both stations, May and June are the wettest months.

The study areas are within an area of the state possessing an exceptionally diverse flora and relatively high levels of vascular plant endemism (Lesica et al. 1984). The endemic species are referred to as either state endemics found only in southwestern Montana, or as regional endemics found also in immediately adjoining areas of neighboring states. The rest of the southwestern Montana flora is made up of many species with biogeographic affinities that include the common Northern Rocky Mountain and the Great Plains elements, as well as Great Basin, Southern Rocky Mountain, Snake River Plain, and Columbia Plateau species. Many are arid climate species favored by the combination of soil, climate, and location features unique to Montana. Thus, the presence of species which are at the margins of their ranges is also high, and the majority of the Montana Species of Special Concern from this area are made up of taxa which are peripheral in the state.

All of the three present study area units are known to harbor sensitive species, but they had not previously been systematically surveyed. Botanical status survey studies conducted in or near the four study areas have provided single-species baselines, including surveys for *Arabis fecunda* (Lesica 1985, 1993, Schassberger 1988, 1990) *Astragalus scaphoides* (Lesica 1984), *Lesquerella*

pulchella (Heidel 1993), and *Penstemon lemhiensis* (Shelly 1987, 1990). Subsequent multi-species survey studies conducted in southwestern Montana have helped to document the breadth of botanical biodiversity, to determine habitat requirements, and to identify potential habitat in other study areas, e.g., Bannack State Park (Vanderhorst 1995); Highland Mountains (Lesica 1992); Tendoy Mountains (Vanderhorst and Lesica 1994, Vanderhorst 1995); Horse Prairie (Vanderhorst 1995); and the Centennial Valley (Culver 1993).

The individual study areas are described in the following text and are presented in this same sequence throughout the report.

Big Hole Study Area

The Big Hole Study Area lies in the outlying McCartney Mountain and its foothills at the south end of the Highland Mountains, north of the large bend in the Big Hole River (Figure 2). It is mainly in Beaverhead County, extending into Madison County, and barely into Silver Bow County. The area consists of nearly contiguous BLM lands interrupted at times by patented mining claims or private lands (usually along the rivers and roads).

The lowest point, <5000 ft., is found along the Big Hole River; the highest point, >8000 ft., is found in the Highland Mountains at the boundary with the Deerlodge National Forest. Parent materials in the Highland foothills are predominantly undifferentiated Tertiary sediments, with Precambrian gneiss, schists, and related rocks. Areas with Colorado Shale, Kootenai Formation, and Boulder Batholith are centered around McCartney Mountain (Ross et al. 1955).

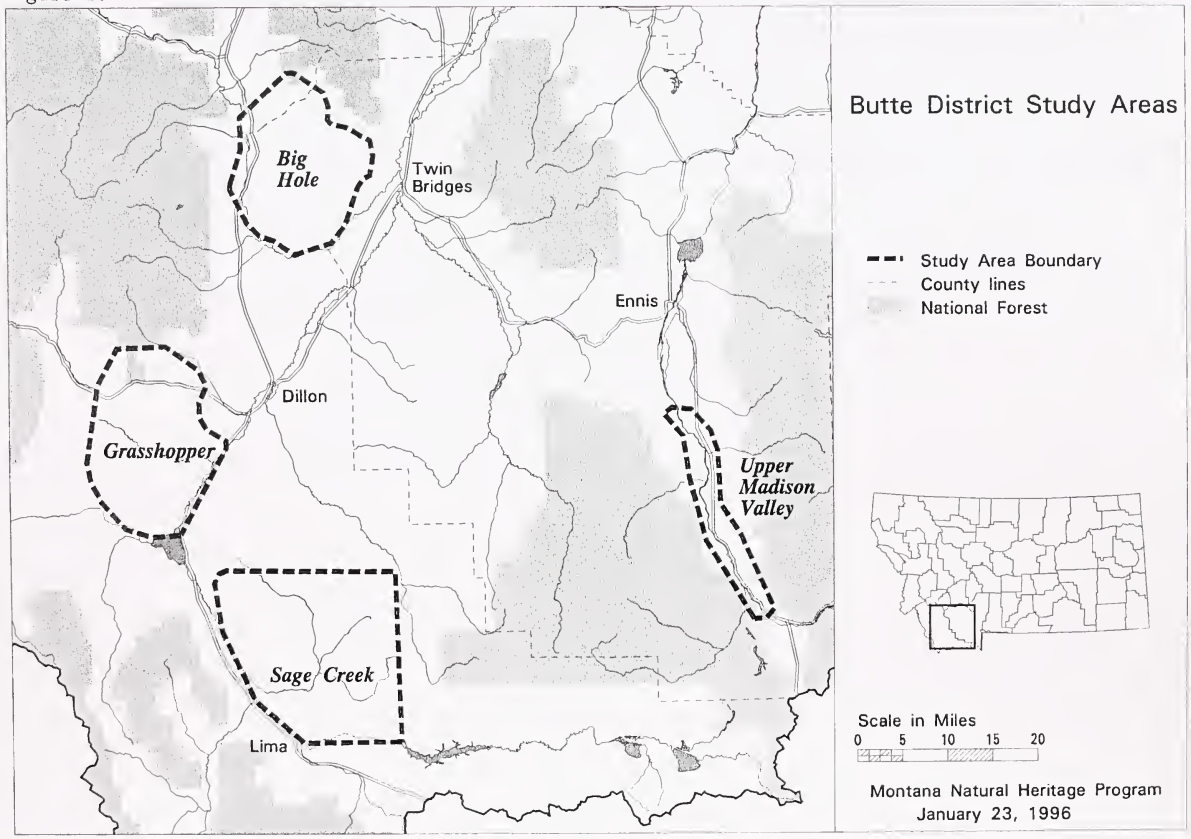
Vegetation of the Big Hole Study area is predominantly grassland and sagebrush steppe, grading into forest types with Douglas fir and lodgepole pine in the Highland Mountains and around McCartney Mountain. The BLM lands skirt the Big Hole valley and its floodplain vegetation, with steep escarpments occurring along the western segment.

Grasshopper Study Area

The Grasshopper Study Area lies in the foothills at the south end of the Pioneer Mountains, Beaverhead County (Figure 2). Grasshopper Creek is the largest central landmark feature in the study area, though the study area extends beyond the Grasshopper Creek watershed. The Beaverhead National Forest lies at higher elevations to the north, and Bannack State Park is located at the western edge of the study area. State school lands and private lands interrupt the otherwise continuous study area.

Amongst the study areas, this section has the most extensive area of limestone surface geology. This is of particular significance, as several of the target species are calciphiles ("calcium-loving" plants). Where these limestone beds come into contact with igneous intrusive rocks are found the largest lode deposits of precious minerals. The lowest points are <5500 ft. along the Grasshopper Creek and Beaverhead River; the highest points are >6500 ft. on Henneberry Ridge. The entire area contains a wide variety of sedimentary rocks oriented in bands that are undifferentiated members from the Cambrian, Mississippian (including limestones), Pennsylvanian, Permian, and Triassic Eras. The prevailing outcrops are undifferentiated Tertiary sediments, interrupted by Tertiary volcanic rock (Ross 1955).

Figure 1.


Butte District Study Areas
Big Hole
Twin Bridges
Ennis
Dillon
Grasshopper
Upper Madison Valley
Sage Creek
Lima
Study Area Boundary
County lines
National Forest
Scale in Miles
0 5 10 15 20
Montana Natural Heritage Program
January 23, 1996

Vegetation is predominantly sagebrush steppe, with limestone ridges of sparse grass cover or mountain mahogany scrub, and occasional limber pine and Douglas fir woodland (on sheltered slopes and at upper elevations). Well-developed riparian vegetation is found along the Grasshopper Creek, Beaverhead

River, and its major tributaries.

Upper Madison Valley Study Area

The Upper Madison Valley Study Area consists of scattered tracts, excluding foothills, along a valley segment of the Madison River in Madison County (Figure 3). This study area is made up of discontinuous BLM tracts, forming an interrupted pattern in comparison to the other study areas. These scattered BLM tracts represent the largest areas of public lands at low elevations in the vicinity.

Madison River valley bottom and stream terraces are mainly made up of Tertiary sediments and of more recent alluvium, of which the coarse sand, gravel, and cobble is interbedded with impervious layers. Coarse sediments have developed into extremely dry soils, and the impervious layers are associated with springs, seeps, and other wetland features. Elevation ranges from ca. 5000 ft. at the north end to ca. 6000 ft. at the north end.

Vegetation is an arid grassland, interrupted by the above-mentioned wetlands and riparian thickets. Dominant grasses are *Agropyron spicatum,* and to a lesser extent *Stipa comata*. These grasses represent an admixture of the *Agropyron spicatum/Bouteloua gracilis* h.t. and *Stipa comata/Bouteloua gracilis* h.t. (Mueggler and Stewart 1980), with little of the short grass component on the coarse cobble substrate. The ground cover of *Selaginella densa* is extensive in some areas of the valley, depending on soil texture and land use history.

METHODS

Prior to fieldwork, the Biological Conservation Database (BCD) maintained by the Montana Natural Heritage Program was queried for records of BLM sensitive species and of other state Species of Special Concern known from the study area or from immediately adjoining areas. This search resulted in a list of 16 species and information about them (Appendix A); numerous other species were found at higher elevations. We refer in this report to "sensitive species;" this is a general term used to encompass all proposed sensitive species and Montana Natural Heritage Program Species of Special Concern that may represent, or previously represented species considered for BLM designation. Primary focus was placed on those species in or around the study area which have been proposed for designation as sensitive by the BLM in its draft list for the 1995 Montana Rare Plant Conference: *Arabis fecunda, Astragalus scaphoides, Astragalus terminalis, Carex parryana* ssp. *idahoa, Lomatium attenuatum, Penstemon lemhiensis, Taraxacum eriophorum,* and *Thelypodium paniculatum* (Bureau of Land Management 1995). Secondary consideration was given to those species known from the area which had not been addressed in previous studies and which had unresolved status questions (e.g., *Stephanomeria spinosa*). Specimens were reviewed in select cases in order to develop the search images. All sensitive species targets and their phenology are summarized in Appendix A.

The phenology of most of the sensitive species targeted for fieldwork was conducive to their location and identification; most fieldwork was conducted in June, early in the growing season, when plants were flowering or in early fruit. Although already past flowering at this time, *Lomatium attenuatum* and *Townsendia nuttallii* were still identifiable. Wetland plants were surveyed after mid-July, along with the remainder of the late-flowering species. Surveys were conducted in the three areas over the 1995 growing season as follows:

Table 1. FIELDWORK SCHEDULE

STUDY AREA	DATES	FIELD BOTANIST
Big Hole	2-5, 12-13, 28-29 June	Heidel
Big Hole	6-8 July	Vanderhorst
Grasshopper	13-18 June, 19-23 July	Heidel
Grasshopper	9-11 July	Vanderhorst
Upper Madison Valley	25-27 July	Vanderhorst
Upper Madison Valley	31 August-1 September	Heidel

The field routes surveyed are mapped in Appendix B.

Searches were conducted on foot in both known and potential habitats of target species, including particularly large, intact, and/or well-developed habitat settings. Special attention was paid to unusual habitats occurring in wetland and rock outcrop settings. Efforts were made to visit all large sectors of the study areas during effective times of the field season.

Field information was compiled on the Plant Species of Special Concern Survey Form, and the populations mapped onto U.S. Geological Survey topographic maps (7.5'). Data collected included detailed information on vegetation, slope/aspect, soil, population size, species biology, and management considerations. Photographs were taken of target species and their habitats (35 mm slides). These have been printed to accompany this report and also conveyed as slide duplicates. Lists of vascular plant species other than those of special concern were not maintained for the scattered areas making up this study.

Voucher specimens of the target species were collected if they provided new distribution or phenological stage information and when adequate material was available in keeping with the Montana Native Plant Society's collecting guidelines (MNPS 1993). Specimens will be deposited at the University of Montana Herbarium (MONTU) and at the Montana State University Herbarium (MONT). Some collections were made of other species if field identification proved difficult or when their presence in the study area represented a major extension of the known range. Following the field season, unresolved taxonomic questions were researched in both of the above herbaria, and determinations or verifications were made in consultation with taxonomists. Such was the case for the genus *Hordeum* (John H. Rumely, Montana State University) and the genus *Erigeron* (Sarah Gage, University of Washington).

Technical references most commonly used to key plants were Dorn (1984) and Hitchcock and Cronquist (1973). Nomenclature used in this report generally follows these references.

RESULTS

In the course of this project, 46 new occurrences of 13 target species were documented (Table 1). Additionally, new information was collected at sites of previously known occurrences. Six of the target species, *Astragalus scaphoides, Astragalus terminalis, Lesquerella pulchella, Lomatium attenuatum, Sphaeromeria argentea,* and *Taraxacum eriophorum*, are on the proposed BLM sensitive species list. Four are recommended for retaining as sensitive; two, *Lomatium attenuatum* and *Sphaeromeria argentea*, are recommended for redesignation as watch. Two species are proposed for deleting from watch status consideration: *Astragalus platytropis* and *Townsendia nuttallii*. The information compiled for each is presented in the following text by study area. Only one species was found in more than one of the study areas: *Astragalus terminalis*. We have also included information on *Phacelia lutea*, which is known in Montana only from one historic collection, located in the Melrose vicinity of the Big Hole Study Area. Three species addressed in this report have also been documented in the Sage Creek area (*Astragalus terminalis, Sphaeromeria argentea,* and *Townsendia nuttallii*), and are cross-referenced between reports. The results section does not include information on previously-documented species that are in the study area for which no new information was collected (*Penstemon lemhiensis* in Grasshopper Study Area).

An overview of known sensitive species distribution in the study areas and their surroundings in southwestern Beaverhead County is presented on a summary map (Figure 4), with the local and statewide distributions of individual species elaborated on maps that accompany the text for each species.

In addition, new populations of ten species that were once on the Montana Plant Species of Special Concern tracking list but have since been deleted were documented in the study area: *Arenaria kingii, Astragalus lentiginosus, Delphinium bicolor ssp. novum, Eriogonum ovalifolium* var. *nevadense, Gentiana aquatica, Gilia inconspicua, Mimulus suksdorfii, Pediocactus simpsonii, Sphaeromeria capitata,* and *Stanleya viridiflora*. Some of these remain on the watch list as species of limited distribution. Interpretation of all results is presented in the discussion section.

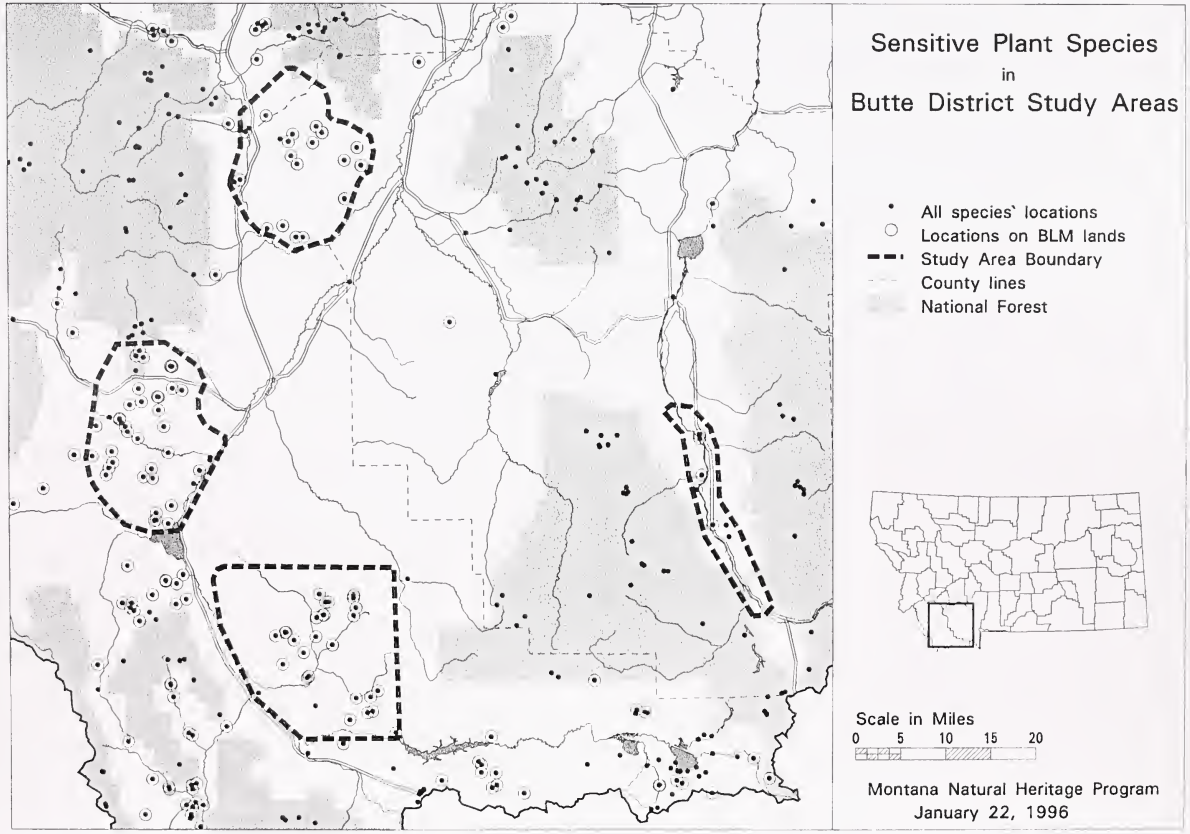
The body of general information provided on each species in the following text includes information stored and maintained in the Plant Characterization Abstract (PCA) Database that is contained in the BCD. Topics taken from the PCA include description information, distribution information, and habitat information. Sources for this information include that taken from floras, from Lesica and Shelly (1991), from monographs, and from earlier reports, as expanded and revised during this field study.

Table 2. Target Species Documented in the Study Areas[1]

Scientific name	No. of **new** records	Current MTHP GRANK/SRANK	Recommended SRANK change	Original proposed BLM status	Recommended BLM status
BIG HOLE STUDY AREA					
Astragalus platytropis	14	G5 S2	S3	Watch	-
Kochia americana	1	G5 SH	SU	-	-
Phacelia scopulina	-	G4 SH	-	-	Watch
GRASSHOPPER STUDY AREA					
Astragalus scaphoides	3	G3 S1	S2	Sensitive	Sensitive
Astragalus terminalis	1	G3G4 S2	S2	Sensitive	Sensitive
Erigeron linearis	1	G5 S1	S1	-	-
Lesquerella pulchella	3	G2 S2	S2	Sensitive	Sensitive
Lomatium attenuatum	3	G3 S1	S2	Sensitive	Watch
Oryzopsis contracta	6	G3 SH	SU	-	-
Phacelia incana	2	G3G4 S1	S1	Watch	Watch
Sphaeromeria argentea	4	G3 S1	S2	Sensitive	Watch
Taraxacum eriophorum	1	G4 S1	S1	Sensitive	Sensitive
Townsendia nuttallii	3	G3 SU	S3	Watch	-
UPPER MADISON VALLEY STUDY AREA					
Astragalus terminalis	2	G3G4 S2	S2	Sensitive	Sensitive
Stephanomeria spinosa	2	G4 S1	S1	Watch	Watch

[1] For complete tallies of the species in the study areas, including previous records, please refer to the information presented in the following sections by species; these sections are accompanied by study area and distribution maps.

Figure 6.


Sensitive Plant Species
in
Butte District Study Areas
All species' locations
Locations on BLM lands
Study Area Boundary
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0 5 10 15 20
Montana Natural Heritage Program
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BIG HOLE STUDY AREA

Surveys in the Big Hole Area produced the largest number of new sensitive species records for a single species: *Astragalus platytropis*. Also documented were new county records for two species that were previously considered for BLM status and tracked by the state but have since been dropped: *Gentiana aquatica* and *Mimulus suksdorfii* in Silver Bow County, and *Gilia inconspicua* in Madison County. While large areas have been heavily grazed, there were notable exceptions. Limestone outcrops, alkaline flats, and wetlands were the primary habitats in this study area for the various target species. Almost all of the spring-fed wetlands north of Rochester were on private land, and those that were investigated on BLM lands were found to be degraded. We were unsuccessful in relocating *Phacelia scopulina*, which is historically known from Montana only in the Melrose vicinity and described in the following text. In the course of searching for it, we instead found *Kochia americana*, which had not otherwise been collected in Montana since 1931.

Both *Astragalus platytropis* and *Kochia americana* are plants of southern biogeographic affinities. Red sage is a peripheral Great Basin species at its northern limits. Broad-keeled milkvetch is a disjunct southern cordilleran species at distinctively low elevation zones in its northern disjunct populations. The *Phacelia scopulina* is a disjunct Columbia Plateau species at its eastern limits.

There are several sensitive species present immediately north of the study area, but they are either on different substrates, in more mesic settings, and/or at higher elevations than those of the Big Hole Study Area.

Astragalus platytropis Gray
BROAD-KEELED MILKVETCH
Bean Family (Fabaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: None.

Bureau of Land Management: Broad-keeled milkvetch was considered for watch status on the draft list circulated in the spring of 1995.

Montana Natural Heritage Program rank: G5 S2 (imperiled) prior to this study; reranked following this study to S3 (vulnerable), and moved the watch list as a species of limited distribution.

DESCRIPTION: Broad-keeled milkvetch is a small perennial herb with leaves clustered at the base of the plant on short branches of the rootcrown clothed with old leaf stalks. Pinnately compound leaves, 1-9 cm long, have 7-15 oblong to elliptic, often blunt-tipped leaflets. Foliage is sparsely-covered with gray or silver hairs. Flower stalks arise among the leaves and bear 3-9 flowers near the tip. Whitish, pea-like flowers are 6-9 mm long with an upper petal that is barely reflexed and nearly the same length as the others. The calyx is 3-5 mm long and sparsely covered with white or black hairs. The inflated fruits lie along the ground when they mature and are conspicuously purple-mottled, papery, and 15-33 mm long, resembling small Chinese lanterns (Figure 7, Appendix D-1). The fruit mature in the latter half of June and persist at least through July.

Superficially, broad-keeled milkvetch resembles the widespread *Astragalus miser* var. *hylophilus* in vegetative condition, except that it has leaves with petioles usually much longer than the blade, and typically has a trailing growth form. The only other species of milkvetch in Montana with inflated pods that lie along the ground is the widespread *Astragalus crassicarpus* (ground plum), which has a very fleshy green or red pod rather the papery-textured, mottled pod of *A. platytropis*.

GEOGRAPHICAL DISTRIBUTION

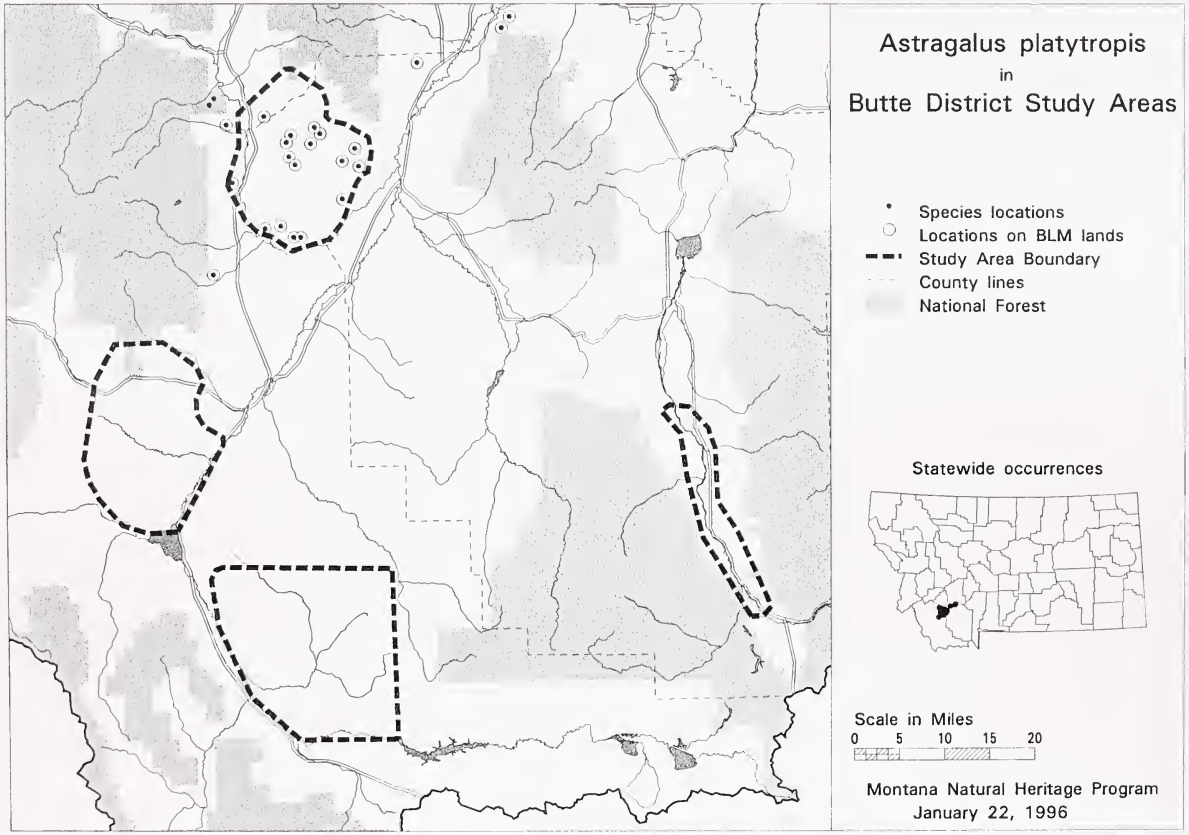
Global distribution: Nevada and California to western Utah, with disjunctions in southeastern Oregon, east-central Idaho, and southwestern Montana.

Montana distribution: Centered in one contiguous area of southwestern Montana in Beaverhead, Madison and Silver Bow counties. It is found in valley margins and foothills to montane slopes in and between the East Pioneer Mountains, Highland Mountains, and Tobacco Root Mountains (Figure 8).

Hitchcock et al 1984

Figure 7.

Figure 8.


Astragalus platytropis
in
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Big Hole distribution: The Big Hole Study Area is in the center of the known distribution of this species in Montana, represented by 18 occurrences which are all on BLM lands, including those 14 new occurrences documented during the course of this study (Figure 8).

HABITAT: In the center of its range, it occupies stony crests, screes, and talus in montane and subalpine settings and is strongly or obligately calciphile. However, in the north disjunct areas of its global distribution, it occupies gravelly ridgetops and barren ridges in the sagebrush belt (Barneby 1989).

The elevation range of the species in Montana extends from ca. 4600 to 6800 ft., from the edge of the Tobacco Root Mountains along the lower Jefferson River valley to the open montane slopes of the Highland Mountains. The settings are most often on ridgetops, but the species may also be found over the full range of slope positions, often appearing as an outlier of hilltop population centers. The substrates are all calcareous but are not all derived from limestone. Parent materials include alluvium, calcareous argillite, and gabbro (volcanic).

In Montana, broad-keeled milkvetch is most often found on thin-soil slopes and ridgetops overlying Madison Group limestone as it outcrops in sagebrush foothills and montane elevations (Appendix D-2). The dominant species is either *Cercocarpus ledifolius* or *Agropyron spicatum*. The species is not restricted to this type of habitat, however. In fact, a wide variety of elevations, substrates, and plant associations were documented in this study as compared with previous habitat characterizations.

Local dominants of the sparsely-vegetated settings include:

Agropyron spicatum h.t.
Artemisia tridentata/Agropyron spicatum h.t.
Stipa comata - Bouteloua gracilis h.t.

The following is a representative list of associated species compiled from this species' habitat range:

Agropyron spicatum
Artemisia frigida
Artemisia nova
Artemisia tridentata
Astragalus adsurgens
Astragalus crassicarpus
Astragalus purshii
Aster scopulorum
Bouteloua gracilis
Erigeron compositus
Erigeron tweedyi
Eriogonum cespitosum
Eriogonum ovalifolium

Gutierrezia sarothrae
Haplopappus acaulis
Ipomopsis congesta
Lepidium ramosissimum
Lesquerella alpina
Koeleria macrantha
Opuntia polyacantha
Oxytropis sericea
Paronychia sessiliflora
Penstemon aridus
Phlox bryoides
Plantago patagonica
Poa scabrella
Selaginella densa
Senecio cana
Stipa comata

POPULATION INFORMATION: The largest known populations are along relatively low elevation limestone ridges, where numbers are in the hundreds (e.g., east of Melrose above Camp Creek). The majority of occurrences have low numbers of plants, often fewer than 10, and are widely scattered across the landscape in clusters or subpopulations. Dispersal of the inflated balloon-like seed may be a factor in producing its scattered, low-density population distribution patterns.
Individuals appear to be relatively long-lived, as judging by the many old leaf remnants found at the root crowns of the specimens collected at two separate sites.

The small size of most populations provides the rationale for retaining broad-keeled milkvetch on the watch list as a vulnerable species of limited distribution despite the many populations, relatively broad ecological amplitude, extent of potential habitat, and low level of threats. It is possible that the small populations originally developed from one or a few individuals, and it could be argued that only the large populations are significant to species conservation, and that EO specifications should be set to disregard or downplay the many small occurrences. Alternately, it could be argued that this species is a generalist in the area where it occurs and typically has very low population numbers.

This pattern of being locally widespread but with very low population numbers is shared with *Townsendia nuttallii* in the Grasshopper Study Area, which is treated similarly.

MANAGEMENT CONSIDERATIONS: There are many low-level threats across its range of habitats. Mining activities are concentrated in the low elevation limestone ridges that are its primary potential habitat, but these are localized. Livestock grazing takes place in the general vicinity of most populations, but the species' habitat is typically on secondary ranges, where the livestock use is light or absent.

If noxious weeds encroach upon its major populations, then this species should return to the list of State Species of Special Concern. Spotted knapweed has invaded below the large Camp Creek population along the public road. Newly-arrived invasions of leafy spurge and knapweed are also at the south end of the Big Hole Study Area. Off road vehicle use is localized and mainly outside of broad-keeled milkvetch population boundaries, though it may accelerate the spread of noxious weeds (Appendix D-3).

As a Montana watch species of limited distribution, it would be appropriate to continue collecting new distribution information and to note any status changes.

Kochia americana S. Wats.
RED SAGE
Goosefoot Family (Chenopodiaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: None.

Bureau of Land Management: None. Species not previously known from BLM lands. No status recommendations are made at this time.

Montana Natural Heritage Program rank: G5 SH (state historical) was the original rank; reranked to SU (state unknown) as a result of the questions raised in this study.

DESCRIPTION: Red sage is a multi-stemmed perennial, ca. 10-50 cm tall, with stems that are woody at the base, usually simple or branched, bearing succulent subterete leaves 5-25 mm long. It has an inconspicuous five-lobed radially symmetrical flower that is sessile in groups of 2-5 in leaf axils along the length of the stems. Flowers are usually perfect, with five stamens and 2-3 stigmas; imperfect flowers lack stamens. The mature perianth is eventually keeled, with a membranous wing up to 3 mm long and 5 mm broad (after Hitchcock et al. 1980; Figure 10; Appendix D-10). The whole plant usually turns a red color after fruiting, hence its common name.

Red sage is recognizable in its vegetative condition throughout the growing season, but definitive identification cannot be made without flowering or fruiting material. In the vegetative condition, the plant resembles a seablite, *Suaeda moquinii* (*S. intermedia*), though *Suaeda moquinii* has not been documented from southwestern Montana to date. The seablite by contrast has a mature perianth which is beaked, without keels or wings. Red sage flowers and fruits late in the growing season, and was just beginning to flower on 17 August under the slightly cool, late growing season conditions of 1995.

GEOGRAPHICAL DISTRIBUTION

Global distribution: Southeastern Oregon to California, east through southern Idaho to extreme southern Montana, Wyoming, Colorado and New Mexico (Hitchcock et al. 1980).

Montana distribution: Red sage is known only from two historic collections and from the recent study (Figure 10). The 1888 specimen of Frank Tweedy (#49) is from "alkaline flats, Beaver Head, Montana," a landmark 12 miles south of Twin Bridges in Madison County along the border with Beaverhead County. The 1931 specimen of B. C. Park (#227) is part of the U.S. National Forest Herbarium collection (RM), so it is presumed to have been collected on national forest lands. The legal description included on the collection label places it on the Beaverhead National Forest near Medicine Lodge Peak, but the label also mentions an elevation of 7000 ft., which is over 600 ft. lower than any terrain in this area. It also describes the setting as dry, with sandy soil, associated with *Artemisia tridentata* and *Opuntia*. Efforts to relocate it were unsuccessful, and habitat in the area appears to be inappropriate (Vanderhorst 1994), so it is not included in the distribution map and is considered unmappable.

Big Hole distribution: Red sage is known from one area on the west side of the Big Hole river ca. 7 miles south of Melrose, entirely on BLM lands (Figure 10).

HABITAT: In general, red sage occupies alkaline plains and hills (Dorn 1984) of semi-arid settings. In Montana, it is expected to be restricted to southwestern intermontane valley sites where salts accumulate.

Habitat at the Big Hole study site is consistent with the general habitat characterization and with what little habitat information is provided for the two earlier collections of this species in the state. It occupies a localized setting of alkaline flats on sandy alluvium and claypans at the base of the valley slopes where salts accumulate. It is present in highest numbers when co-dominant with *Distichilis stricta* in an understory of *Sarcobatus vermiculatus* and *Artemisia tridentata* (Appendix D-11). It is also present in washes and other sparsely-vegetated settings. A few waifs were found on adjoining gravelly grassland slopes.

The following is a representative list of associated species in the species' primary habitat:

Agropyron spicatum
Artemisia tridentata
Atriplex nuttallii
Bouteloua gracilis
Descurainia richardsonii
Distichilis stricta
Lappula redowskii
Opuntia polyacantha
Sarcobatus vermiculatus
Sitanion hystrix

POPULATION INFORMATION: The population is spread out across two sections in an area of at least 360 acres. It is locally abundant and co-dominant in less than half of this area. At

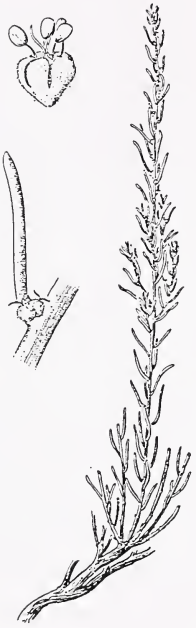
minimum, the population consists of 10,000 individuals.

The plant appears to be relatively long-lived, as judging by the presence of many plants with stout woody bases and numerous old, broken-off stems. Small plants were also present without woody bases, appearing to represent a mixed age structure that includes immature individuals.

MANAGEMENT CONSIDERATIONS: Red sage appears to be palatable to livestock early in the growing season but avoided throughout mid and late summer. The Big Hole populations were in two different pastures, and many plants in the Section 28 pasture that was grazed early in the season were browsed to the ground. The grazed plants produced vigorous new stems, though they had fewer stems than ungrazed plants. No signs of grazing were found on red sage in the Section 27 pasture. Livestock was not seen in the pasture during a June and an August visit, but the site appeared to be grazed later in the season. In preliminary observations, we did not discern a difference in their densities and survival with the presence or absence of grazing. It is possible that habitat alterations incidental to grazing, such as gullying and increases in the numbers of exotic species, pose threats. Allotment information already on hand may help to elaborate or to modify this assessment.

In Section 27, red sage is also part of a plant association that is being considered for addition to the state vegetation classification. It is codominant with *Distichilis stricta* in the understory of *Sarcobatus vermiculatus - Artemisia tridentata.*

The large population and possible lack of response to grazing provide reason to question whether this species belongs on the list being tracked as Montana Species of Special Concern. Most of its potential habitat is on low elevation alkali flats, which are likely to be concentrated on private lands. It remains on the list because the information collected at this single site is insufficient for extrapolation across all of southwestern Montana. It is appropriate to search for this species in the course of allotment studies locally in both the Dillon and Headwaters Districts.

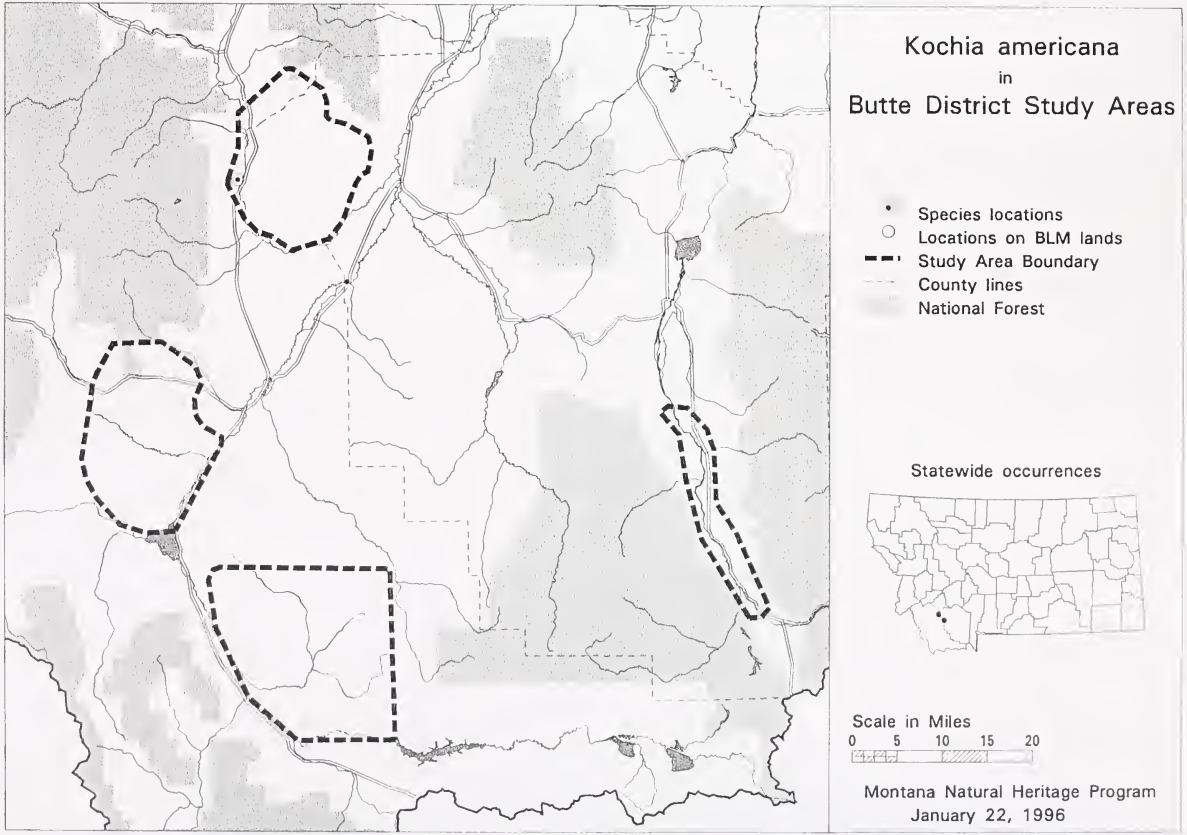


Kochia americana

Hitchcock et al. 1984

Figure 9.

Figure 10.


Kochia americana
in
Butte District Study Areas
Species locations
Locations on BLM lands
Study Area Boundary
County lines
National Forest
Statewide occurrences
Scale in Miles
0 5 10 15 20
Montana Natural Heritage Program
January 22, 1996

Phacelia lutea (Hook & Arn.) J. T. Howell
var. *scopulina* (A.Nels.) Cronq.
DWARF PHACELIA
Waterleaf Family (Hydophylaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife: None.

Bureau of Land Management: None. It has not been documented on BLM lands and therefore has not been considered.

Montana Natural Heritage Program rank: G4 SH (state historical).

DESCRIPTION: Dwarf phacelia is a low annual, branched at the base into several prostrate stems that form mats up to 5 dm (20 in.) across. The alternate to nearly opposite, oblong, lance-shaped leaves, 5-30 mm long, have petioles and entire to lobed margins. Foliage has short, spreading hairs. Flowers are borne on short, narrow, coiled stalks arising from axils of upper leaves. Flowers have 5 linear sepals, 3-7 mm long, and yellow, tubular corollas, 3-5 mm long, flaring into five short lobes. The style, ovary, and elliptic seed capsule, 3-6 mm long, are hairy. Stamens are shorter than the corolla.

The combination of annual prostrate stems, lobed leaves, and flaring, tubular, yellow corollas distinguish this species within the genus. A hand lens may be needed to examine the small flowers.

GEOGRAPHICAL DISTRIBUTION

Global distribution: Dwarf phacelia is found in central and eastern Nevada, adjoining Utah, and southeastern Oregon; disjunct in southwestern Wyoming and southwestern Montana.

Montana distribution: The only Montana record is based on an out-of-state specimen, so label information was secured from the New York Botanical Garden before fieldwork. The collection was made by P. A. Rydberg (#2771) in 1895 from "Melrose," which lies near the junction of three county borders (Beaverhead, Madison and Silverbow).

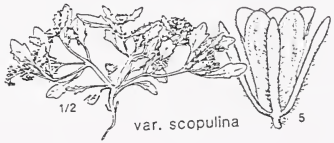
Big Hole distribution: Efforts to relocate the species were unsuccessful. As an annual species, its numbers are expected to vary much from year to year. It appeared that the alkali flats setting south of Melrose in which red sage was found may be consistent with the general habitat conditions of the dwarf phacelia; further surveying at the site is warranted.

HABITAT: No habitat information is provided on the single Montana collection of this species. In the Intermountain Flora (Cronquist et al. 1984), the only habitat characterization provided is that of the species in all its varieties: "Alkaline, usually barren clay (rarely sandy) banks and flats in the deserts and foothill."

POPULATION INFORMATION: None available.

MANAGEMENT CONSIDERATIONS: It is appropriate to search for this species in the course of on-the-ground range work in the Melrose vicinity of both the Dillon and Headwaters Districts. Extended survey at the red sage site is also warranted.

Phacelia lutea var. scopulina



Cronquist, et al. 1984

Figure 11.

GRASSHOPPER STUDY AREA

Surveys in the Grasshopper Study Area yielded the highest number of records for different sensitive species among the three areas, reflecting the area's botanical diversity and extent of appropriate habitat. New records were documented for ten species, in addition to those already known, for *Astragalus scaphoides*, *Lesquerella pulchella, Penstemon lemhiensis*, Bannack State Park species, and various others.

The Grasshopper Study Area sensitive species are made up primarily of state and regional endemics (*Astragalus scaphoides, Astragalus terminalis, Lesquerella pulchella, Lomatium attenuatum, Oryzopsis contracta, Penstemon lemhiensis, Taraxacum eriophorum*, and *Townsendia nuttallii*). Secondarily, the area consists of peripheral species. *Phacelia incana* and *Sphaeromeria argentea* are centered in the Great Basin/Salmon Plains. Also present are southern cordilleran species which are at their northern limits. One of the other peripheral species, *Erigeron linearis*, is a western species at its eastern limits.

Astragalus scaphoides (Jones) Rydb.
BITTERROOT MILKVETCH
Bean Family (Fabaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: 3C (USDI Fish and Wildlife Service 1993). Ranking signifies that the species has "proven to be more abundant or widespread than previously believed and/or....(is) not subject to any identifiable threat" and is based in large part on the numbers of populations in Idaho.

Bureau of Land Management: *Astragalus scaphoides* was included on the BLM draft list of sensitive species for Montana distributed for review in 1995.

Montana Natural Heritage Program rank: G3 S1 (critically imperiled in the state) prior to this study. There are now 17 Montana occurrences of this species, only one of which is extirpated. The number of new records provides basis for reranking it as "S2" (imperiled in the state), assuming that the extant populations are not subject to immediate threat.

DESCRIPTION: *Astragalus scaphoides* is a stout herbaceous perennial with several erect stems, 2-6 dm (8-24 in.) high, from a branched rootcrown. Pinnately-compound leaves are 10-25 cm (4-10 in.) long with 15-21 narrowly elliptic leaflets. Foliage is glabrous to sparsely hairy. Infloresences are borne in the axils of upper leaves and have 15-30 spreading, crowded flowers

that become more remote as the plant matures. Yellowish-white flowers are ca. 20 mm long with a reflexed upper petal and a blackish-hairy calyx, 8-10 mm long. Glabrous, green to reddish, oblong pods are 15-20 mm long and 2-chambered in cross-section. Each pod is on a stem as long as the pod that spreads out and then arches up, holding the fruit nearly erect (Figure 12; Appendix D-4). *Astragalus scaphoides* flowers in mid-late June and produces fruit from June-July.

The long fruit stalks arch out and up, holding the pods like a candelabra. The pods are also 4-6 mm wide, collectively distinguishing it from the similar species, *A. atropubescens* and *A. terminalis*.

GEOGRAPHICAL DISTRIBUTION

Global distribution: *Astragalus scaphoides* is a narrow endemic restricted to Lemhi County, Idaho, where it is in the foothills of the Bitterroot Mountains and adjoining valleys, and in a separate area of the foothills and high plains in southwestern Beaverhead County, Montana.

Montana distribution: *Astragalus scaphoides* is found in southwestern Beaverhead County in the drainages of the Grasshopper, Horse Prairie, and Medicine Lodge Creeks, and in the upper Beaverhead River, constituting a total of 17 Montana occurrences. The majority, including all of the largest occurrences, are on BLM lands (Figure 13).

Grasshopper distribution: Twelve of the 17 Montana occurrences are from the Grasshopper Study Area (Figure 13). One is an historic collection made on private land at the mouth of Grasshopper Creek that is presumed extirpated, and one is an historic collection made near the Bannack townsite that has also likely been destroyed.

HABITAT: *Astragalus scaphoides* is distributed across "open valleys, low hills, (and) canyon benches ..." (Barneby 1964) in foothills and lower montane settings. In the study area, it occurs on lower slopes, terraces, and flood plains, extending high on slopes when the slopes are gentle or sheltered. It occupies a wide range of slopes and aspects. Mesic microhabitat appears to be good potential habitat throughout the study area, though large areas of potential habitat have been altered and are unoccupied such as the valleybottoms of Grasshopper Creek and tributary mouths (see management discussion). With higher elevations, as found outside the study area in the Tendoy Mountains, the species extends onto exposed, southerly slopes. Its elevation in Montana ranges from 5300-6900 ft.

It typically grows in sagebrush grasslands dominated by *Artemisia tridentata* and *Agropyron spicatum*. Under heavy grazing, the sage takes on a rank, spindly form and Astragalus scaphoides is absent or present in only trace amounts (e.g., segments of Cold Springs Creek, Appendix D-6), with or without, population remnants at the base of the valley slope (Appendix D-15). Other shrub species which are subdominant or in some cases replace big sagebrush in these habitats include *Artemisia nova* and *Chrysothamnus nauseosus*. Common or subdominant grasses at the sites include *Stipa comata, Oryzopsis hymenoides, Festuca idahoensis*, and *Poa secunda*. Although there are several other species of milkvetches in the vicinity, including *Astragalus agrostis, A. adsurgens, A. atropubescens, A. drummondii*, and *A. lentiginosus*, they are not regularly found in the same mesic setting as *A. scaphoides*.

Astragalus scaphoides

From Hitchcock and Cronquist 1961

Figure 12

A representative list of associated species includes the following:

Agropyron spicatum
Allium textile
Artemisia nova
Artemesia tridentata
Aster scopulorum
Chrysopsis villosa
Chrysothamnus nauseosus
Festuca idahonis
Leptodactylon pungens
Lupinus argenteus
Opuntia polyacantha
Oryzopsis hymenoides
Phacelia linearis
Phlox longifolia
Poa secunda
Stipa comata

The soil substrates vary greatly. In the study area, they are derived from limestone, diabase and other volcanic materials, and from basin sediments, most often as stony loams but also including clayey and gravelly soil textures.

POPULATION INFORMATION: Population numbers range from <50 to >5000 plants. Two of the three large populations (>5000) in Montana are in the study area, located north of Henneberry Ridge (#017), and in the Coal Creek headwaters area (#016).

Reproduction is by seed and the species is relatively long-lived. It can go dormant through entire growing seasons (Lesica and Steele 1994), an adaptation which confounds population size and trend estimates. The cool, moist conditions early in the 1995 growing season appeared to have favored it. Previously documented populations were revisited in 1995; observed numbers were high.

MANAGEMENT CONSIDERATIONS: This highly palatable species is grazed in preference to *Agropyron spicatum* (P. Lesica pers. obs.). High stocking rates and repeated spring grazing will eliminate fruit production and thus, the population's ability to sustain itself over the long term. Monitoring of *Astragalus scaphoides* under different grazing regimes has suggested that *A. scaphoides* can persist if predation is moderate, or absent during some years, as with rotation grazing (Lesica 1995).

The current study and favorable growing season afforded an opportunity to independently study distribution of *Astragalus scaphoides* across the landscape in relation to management activities. The largest Montana populations of this species are north and south of Grasshopper Creek in

very large pastures that are either grazed in winter, or which have extensive secondary ranges. Heavy spring grazing has been shown to damage populations (Lesica and Elliott 1987). In the study area, the species tends to be oriented along valleys, and in several locations could be traced from headwaters sporadically to Grasshopper Creek inlets over 2 miles away, disappearing where cattle use is heaviest. There are also fence line contrasts that corroborate this pattern, e.g., *Astragalus scaphoides* being locally common on the BLM side of a fence and uncommon in the adjoining state school land section that was in poorer range condition (#008; Appendix D-5).

Astragalus scaphoides has one of the narrowest global distributions of plant species in this study. The species is locally common in Idaho (Barneby 1964, Lesica and Elliott 1987) but not in Montana. Only three populations in the state have populations exceeding 5000, including the Coal Creek and Henneberry Ridge populations in the Grasshopper Study Area (#016, 017). Nearly all known Montana occurrences are on BLM-administered lands. BLM management of this species and of these key sites are critical in its conservation.

Spotted knapweed is encroaching in another major population (EO#008), and could become a grave management problem for this species throughout the study area.

Astragalus terminalis Wats.
RAILHEAD MILKVETCH
Bean Family (Fabaceae)

The greatest numbers of railhead milkvetch were found in the Upper Madison Valley Study Area; Grasshopper Study Area species information can therefore be found in the Upper Madison Valley Study Area results.

Erigeron linearis (Hook.) Piper
LINEARLEAF FLEABANE
Aster Family (Asteraceae)

CONSERVATION STATUS

U. S. Fish and Wildlife Service: None.

Bureau of Land Management: This species was not previously known from lands administered by the Bureau of Land Management, so it has not been reviewed for BLM status. It is not recommended for BLM designation at this time because of the questions raised about the naturalness of the study area population.

Montana Natural Heritage Program rank: G5 S1.

DESCRIPTION: Linearleaf fleabane has unbranched stems, 5-30 cm (2-6 in) tall, from a stout taproot and branched rootcrown. The mostly basal leaves are linear and 1-9 cm (0.5-3.5 in) long; the bases of the stems and leaves are enlarged and straw-colored or purplish, and the herbage is covered with fine gray hairs. The flower heads are usually solitary at the ends of the stems; the involucral bracts are 4-7 mm long and are covered with long, appressed hairs and occasionally also with glads. The 15-45 yellow rays are 4-11 mm long. The yellow disk flowers are 3-5 mm long (Figure 14; Appendix D-9). There are 10-20 pappus bristles at the top of each seed (achene). Plants were near peak flowering at 14 June 1995.

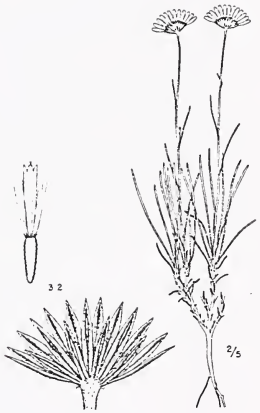
This is the only yellow-flowered fleabane in Montana. The *Erigeron* genus is distinguished from other yellow-flowered genera in the Aster Family with which it might be mistaken in having involucral bracts that are in only one series.

GEOGRAPHICAL DISTRIBUTION

Global distribution: Southern British Columbia, south through eastern Washington and Oregon to northern Nevada and Yosemite National Park, east through central Idaho to Yellowstone National Park and southwestern Montana.

Montana distribution: The three collections include one in the Bitterroot Valley made on private lands in 1973, one historic collection west of Dillon, and the recent study area collection which may correspond to the vague location information of the historic collection (Figure 15).

Grasshopper distribution: The single study area collection was confined to a small discrete area. It may be a part of the native flora elsewhere in the local landscape, or an accidental introduction that was brought in with mining activity (Figure 15).



E. linearis

Hitchcock et al 1984

Figure 14.

HABITAT: The rolling foothills setting is on granular, diabase-derived sediment with vegetation dominated by *Artemisia tridentata/Agropyron spicatum*. It is consistent with all available information on the Ravalli County collection site in being dry, rocky, and east-facing. The area where *Erigeron linearis* is present corresponds with a gap in *Artemisia tridentata* dominated by *Agropyron smithii*. The ½ ha opening in sage cover is traversed by a faint 2-track leading to an old mining test dig nearby. There is no apparent break in the physical environment. Other native species that are common on the adjoining hillside are absent in the small opening, while disturbance-favored species are locally common. The population site may have been grubbed or accidentally burned such that the sage was killed. Otherwise, a highly restricted microhabitat condition such as a claypan could be present apart from disturbance. Associated species include:

Agropyron smithii
Arenaria kingii
Bromus tectorum
Chrysopsis villosa
Haplopappus acaulis
Oxytropis sericea
Phlox bryoides

POPULATION INFORMATION: The population consisted of ca. 50 individuals. Most were multi-stemmed and vigorous.

MANAGEMENT CONSIDERATIONS: The origin of this occurrence, whether natural or associated with disturbance, must first be resolved to determine whether or not it warrants management concern. To help resolve such questions, the species should be sought during range work in this area of the allotment.

Lesquerella pulchella Rollins
BEAUTIFUL BLADDERPOD
Mustard Family (Brassicaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: None.

Bureau of Land Management: Proposed sensitive in the draft list that was circulated in 1995.

Montana Natural Heritage Program rank: G2 S2.

DESCRIPTION: Beautiful bladderpod is a herbaceous perennial with unbranched, prostrate to ascending stems arising from a branched rootcrown and taproot. The basal leaves have short petioles and elliptic, entire-margined blades. The alternate stem leaves are smaller and lack petioles. Foliage is covered with dense, silvery, branched hairs. Yellow, stalked flowers are borne at the top of the stems in a narrow inflorescence that elongates as the fruit matures. Each flower has 4 separate petals, 4 separate sepals, and 4 long and 2 short stamens. The flattened, broadly elliptic capsules (silicles) have a keel on each face (from Rollins 1995; Figure 16; Appendix D-12). Flowering is between late May to mid June in normal years for the foothills settings; in early June to early July in normal years for the subalpine settings. Within the study area, a second flowering has been observed in mid- to late August during a growing season that was early and droughty (Heidel 1993).

It is one of several endemic *Lesquerella* species in Montana, which occupy similar kinds of habitat and require mature fruits for identification. Until recent taxonomic research (Rollins 1995), it was provisionally treated as *Lesquerella carinata* based on personal communications with Rollins (Schassberger 1991, Heidel 1993). The flattened, unlobed, keeled silicles separate this plant from species of *Physaria* and *Lesquerella* in our area, except *L. carinata* var. *languida* which has narrowly elliptic fruits.

GEOGRAPHICAL DISTRIBUTION

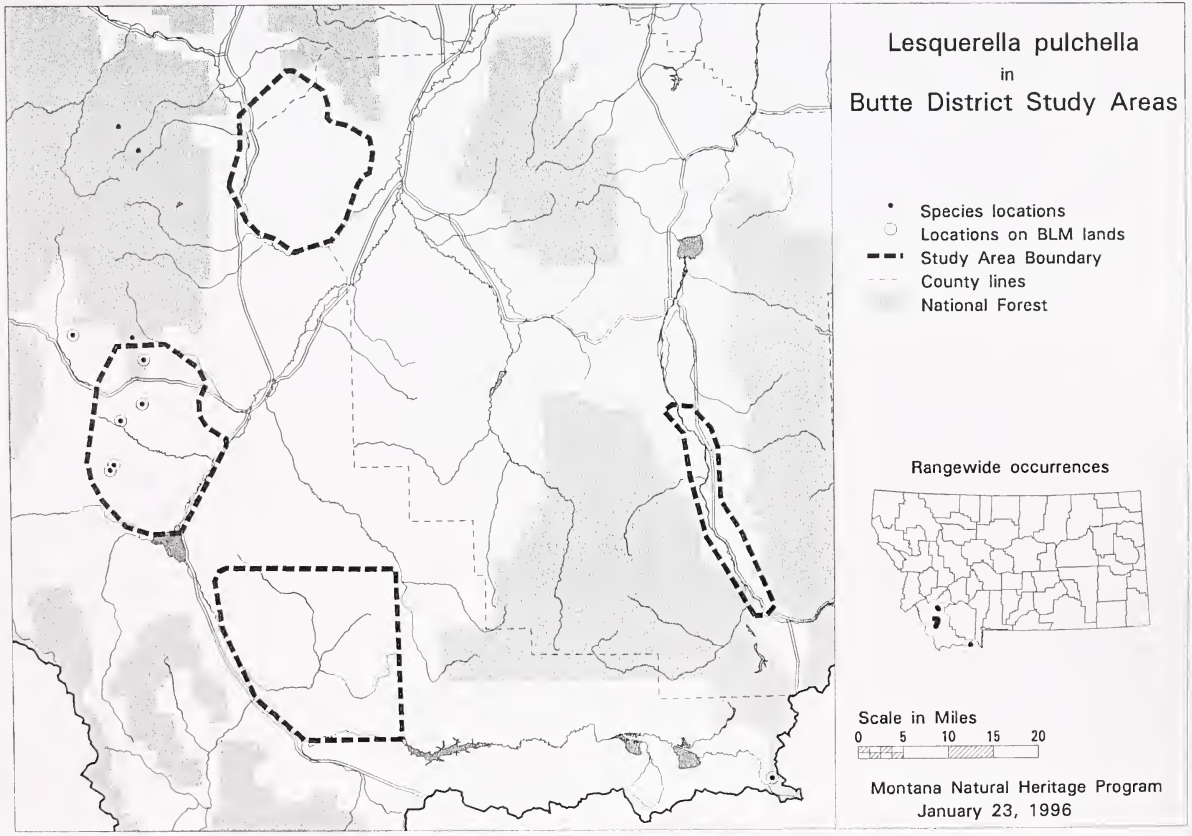
Global distribution: Endemic to southwestern Montana

Montana distribution: This species is known only from Beaverhead County, from nine occurrences in the Pioneer Mountains area and one in the Centennial Mountains (Figure 17). This is a correction to its reported distribution in Heidel (1993) which mistakenly ascribed a specimen of *L. paysonii* from Deerlodge County to it.
Grasshopper distribution: Known from five occurrences along the western edge of the study area, representing half of the known occurrences for this species throughout its rangewide. All five are wholly or partly on BLM lands (Figure 17).

Lesquerella pulchella
Vanderhorst #5186

Figure 16.

Figure 17.


Lesquerella pulchella
in
Butte District Study Areas
Species locations
Locations on BLM lands
Study Area Boundary
County lines
National Forest
Rangewide occurrences
Scale in Miles
0 5 10 15 20
Montana Natural Heritage Program
January 23, 1996

HABITAT: *Lesquerella pulchella* is a calciphilic species which occupies harsh habitat under low competition. In the study area it is restricted to limestone outcrops of the Madison Group in north-south bands centered around Bannack. Note: This is not the only Madison Group outcrop in the study area, and in the extensive Madison Group dolomite outcrops around Henneberry Ridge, only the common bladderpod species, *Lesquerella alpina*, has been found.

It spans a 6200-7590 ft range of elevation in the study area, extending upward into lower elevations of the adjoining Beaverhead National Forest. It is also at subalpine elevations of the same Pioneer Mountains area, and known from a single subalpine area in the Centennial Mountains which is from quartzite rather than limestone. Its subalpine elevations range from 8600-9200 ft. This bimodal distribution in elevation zone may reflect its preference for open habitats under low competition. The following habitat description focuses on the foothills habitat of the species as found in the study area, which is typical for the foothills habitat of the species in general. Description of the subalpine habitats of the species is summarized briefly at the end.

In the study area it occupies some of the most arid, exposed microhabitats on gravelly, shallow substrate over bedrock. It is often on mid and upper slopes, with the angle of slope and the aspect depending on local outcrop variables. The settings tend to be sparsely-vegetated pockets within scrub and grassland communities of the foothills. Local dominant is *Agropyron spicatum*, with or without *Cercocarpus ledifolius* (Appendix D-13). Tree cover of *Pinus flexilis* is patchy and restricted.

A representative list of species commonly occurring with it include:

Achillea millefolium
Agropyron spicatum
Allium textile
Arenaria kingii
Artemisia frigida
Aremisia tridentata
Carex rossii
Castilleja pallescens
Cercocarpus ledifolius
Chaenactis douglasii
Delphinium bicolor ssp. novum
Douglasia montana
Draba oligosperma
Erigeron tweedyi
Gilia congesta
Gutierrezia sarothrae
Haplopappus acaulis
Juniperus scopulorum
Linum lewisii
Lesquerella alpina

Lomatium attenuatum
Mimulus suksdorfii
Penstemon aridus
Petrophytum cespitosum
Phlox bryoides
Pinus flexilis
Poa secunda
Pseudotsuga menziesii
Senecio canus
Sphaeromeria argentea
Townsendia nuttallii

The preference of this species for low-competition settings was evident in the study area by its sporadic colonization of a gravelly open stream bed in low numbers below the BLM population near Bannack.
It was also found on an abandoned two-track road at a point over limestone bedrock leading to the Ermont Mill and No. 2 Mine. This was located close to a well-established "natural" population and was made up of comparatively few plants. In its natural setting, the habitat is subject to frost heaving. While there is also rodent burrowing activity in the area, the species does not usually occur in these disturbed mounds.

In the Centennial Mountains and upper elevations of the Pioneer Mountains *Lesquerella pulchella*, has been documented in parkland and open ridge top settings, where a preliminary list of associated species includes:

Abies lasiocarpa
Carex geyeri
Carex rossii
Dryas octopetala
Eritrichium nanum
Geum rossii
Hedysarum suphurescens
Lesquerella alpina
Lloydia serotina
Picea engelmanii
Pinus albicaulis
Poa alpina
Pseudotsuga menziesii
Silene acaulis
Valeriana dioica

POPULATION INFORMATION: Population numbers in the study area range from <100 to >5000. All of the largest populations of this species >1000 plants are on BLM lands, and three

of the four are in the Grasshopper Study Area, including:

Badger Pass	BLM
Bannack	spanning BLM and state
Rocky Hills	BLM

A fifth population at Black Lion Mountain on Beaverhead National Forest was described as "common" without an estimate of population size. As a state endemic, these data represent its global populations numbers.

Most of these low elevation populations cover small areas because the outcrop habitat is limited and the discontinuous nature of the outcrop habitat accounts for the discontinuous distribution pattern across the landscape.

Individuals are relatively short-lived and dependent on seed production (Schassberger 1991). The populations may vary in size and extent with yearly climate shifts. The population structure and dynamics appear to be very similar to that of *L. carinata* var. *languida* (Greenlee 1994, from Vanderhorst 1995).

MANAGEMENT CONSIDERATIONS: It was recommended that this species' status be reviewed after the species was published in the literature, and more complete survey studies were conducted (Heidel 1993). The information gathered in this study has not significantly expanded its distribution or allayed concerns over potential threats. While it has similar habitat requirements to *Lomatium attenuatum*, they are narrower and more restricted to settings with mining activity. It is also more short-lived. For these reasons, it is recommended for retaining as sensitive by the BLM.

Many of the study area population sites adjoin active mines, and most are marked with mining claims. One of the largest populations is located at Bannack among four other Montana Species of Special Concern, and major strides in biodiversity conservation and public education might be made by protecting the areas administered by both state and federal agencies at one time.

Noxious weed invasion has not entered this species' habitat to date, though there is potential for it to encroach upon and to out-compete short-lived perennials in this setting, as is happening in the case of *Lesquerella carinata* var. *languida* habitat, which is being encroached upon by *Centaurea maculosa* (Vanderhorst 1995).

Lomatium attenuatum **Evert**
TAPERTIP BISCUITROOT
Parsley Family (Apiaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: 3C (USDI Fish and Wildlife Service 1993); This signifies that the species has "proven to be more abundant or widespread than previously believed and/or....(is) not subject to any identifiable threat."

Bureau of Land Management: *Lomatium attenuatum* is included on the BLM's list of proposed sensitive species for Montana (USDI Bureau of Land Management 1993).

Montana Natural Heritage Program rank: G2 S1; in Wyoming, the species has recently been reranked as S2 from S3 (Fertig 1996), and its global rank changed from G3 to S2 accordingly.

DESCRIPTION: Taper-tip biscuitroot is a perennial herb with 1 to several stems, 10-25 cm (4-10 in.) high, from a long, thick taproot and a simple or branched rootcrown. The few alternate, elliptic leaves are 3-times divided into narrow ultimate segments, 2-5 mm long and less than 2 m wide. The leaf petioles form a dilated sheath that enfolds the stem. Foliage is mildly sandpaper-like but without hair. Tiny yellow flowers are borne in hemispherical clusters, subtended by 0-6 separate, linear bracts (involucel), that are arranged at the ends of 5-8 stalks, 3-5 mm long, in an umbrella-like inflorescence at the top of the stem. Five separate petals, 1-2 mm long, surmount an ovary that matures into a glossy, glabrous, flattened elliptical fruit 5-8 mm long, with four low ridges on each face (from Evert 1983; Figure 18; Appendix D-14). The flowers appear with the leaves by early May. Individual plants have a range in maturity between umbellets on a plant so that flowering and fruiting is staggered and extended for several weeks in favorable years. Flowering continued into early June in 1995.

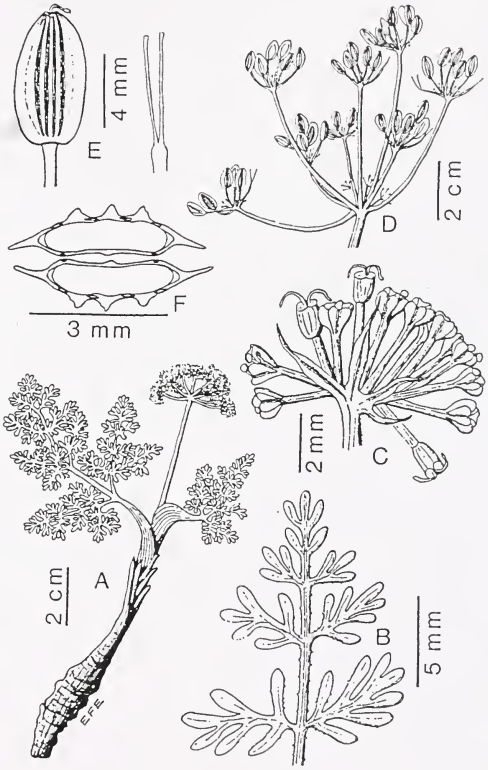
Lomatium is a difficult genus; a hand lens or microscope and technical key are essential for determination. This species is most similar to *L. cous*, which it resembles in habit and leaf dissection. The latter has an involucel of elliptic bracts and is less scabrous.

GEOGRAPHIC DISTRIBUTION

1. **Global distribution:** The species is known only from Park County in northwestern Wyoming (Evert 1983, Dorn 1992) and from southwestern Beaverhead County, Montana.

2. **Montana distribution:** *Lomatium attenuatum* was first discovered in the state in 1993 by Peter Lesica on BLM land in the Tendoy Mountains (Vanderhorst and Lesica 1994). Additional populations were found in 1994 in the Tendoy Mts. and to the north near

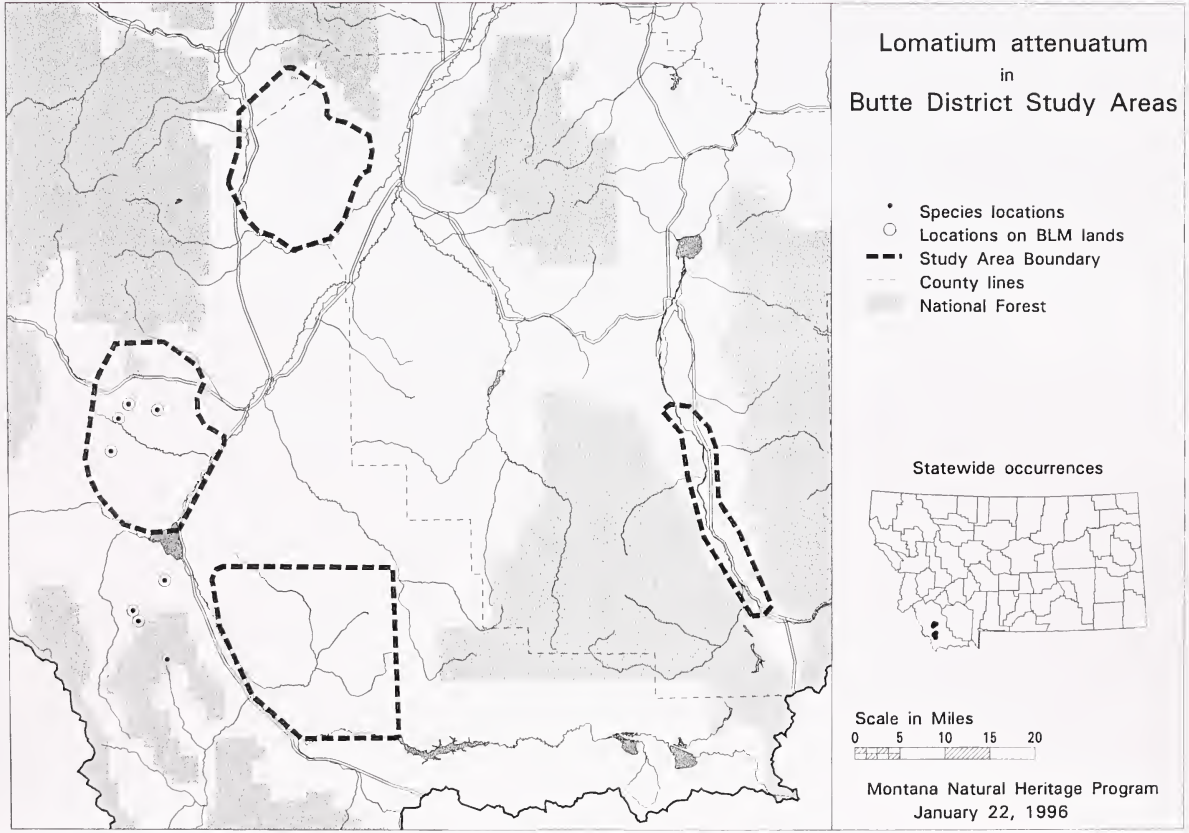
Lomatium attenuatum



From Evert 1983

Figure 18.

Figure 19.


Lomatium attenuatum
in
Butte District Study Areas
Species locations
Locations on BLM lands
Study Area Boundary
County lines
National Forest
Statewide occurrences
Scale in Miles
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Bannack (Vanderhorst 1995) for a total of eight records (Figure 19. Seven of them are wholly or partly on BLM lands. Note: Specimens of *L. cous* have been reviewed and annotated at both MONT and MONTU.

3. **Grasshopper Study Area distribution:** The species was documented to a greater extent around Bannack, and eastward toward Dillon in the Grasshopper Creek Study Area, representing four of the eight known occurrences in the state (Figure 19).

HABITAT: In Montana, *Lomatium attenuatum* grows in talus and gravelly to rocky soils derived from Madison Group limestone, an outcrop substrate associated with a range of landform that supports distinctly calciphilic vegetation. Evert (1983) describes the soils where the species is found in Wyoming as "lithosols derived from volcanic material or limestone." The species has not been found associated with volcanics in Montana. It spans an elevation of 6200-8500 feet in the state, but occurs at the lower end of this range in the Grasshopper Study Area.

In the Study Area, *Lomatium attenuatum* grows in semi-arid grassland (Appendix D-15), mountain mahogany (*Cercocarpus ledifolius*) communities and limber pine (*Pinus flexilis*) parkland. It occupies the following habitat types:

Agropyron spicatum h.t.
Cercocarpus ledifolius h.t.
Pinus flexilis h.t.

A representative list of associated species includes:

Agropyron spicatum
Allium textile
Artemisia frigida
Cercocarpus ledifolius
Cryptantha celosioides
Delphinium bicolor ssp. novum
Lesquerella pulchella
Petrophyton cespitosum
Phacelia incana
Pinus flexilis
Sphaeromeria argentea
Townsendia spathulata

The vegetation is typically sparse and stress-resistant, and *Lomatium attenuatum* is not found in dense vegetation. It is sometimes found in disturbance settings. An example is its occurrence at edges of the street in Bannack; however, it here occurs in very low numbers (accidental introduction) in comparison to its natural habitat.

POPULATION INFORMATION: Population numbers range from 10 to >10,000 in the state. The latter population is in the study area and represents the largest known population of this species in Montana, one which straddles Bannack State Park and adjoining BLM lands (#003). Most other populations are in the thousands except for those few which were found on small, isolated outcrop areas. Reproduction is by seed.

MANAGEMENT CONSIDERATIONS: Immediate management requirements have not been identified because the slopes where it grows have limited forage production for grazing and do not produce commercial timber. However, the global rank of this species has recently been changed from G3 (globally vulnerable) to G2 (globally imperilled) because it has a narrow distribution throughout its range in Montana and Wyoming. Even if it has no immediate threats to support BLM designation as sensitive, it is critical that it remain on the BLM watch list and its status be further evaluated in Montana. The species could potentially be impacted by road construction, mining activities, or weed invasion.

Oryzopsis contracta **(Johnson) Shechter**
CONTRACTED INDIAN RICEGRASS
Grass Family (Poaceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: None at present. It was recently listed as a Category 2 (C2) species by the U.S. Fish and Wildlife Service (1993), although survey and herbarium studies in Wyoming documented a broad distribution, and limited degree of threats. This provided the basis for recommending that it be dropped from further consideration.

Bureau of Land Management: None. It was not previously known from BLM lands in Montana.

Montana Natural Heritage Program rank: G3 SH (state historical); reranked SU as a result of this study.

DESCRIPTION: Contracted Indian ricegrass is a tufted perennial with glabrous stems 12-28 inches tall. The inflorescence is a panicle with branches that are initially contracted (hence the common name) but which become stiffly spreading at maturity (Figure 20; Appendix D-16, D-17). Spikelets are single-flowered, slender, and 3/8 inch long. The lemmas are covered by short, white, silky hairs that do not exceed the lemma; the lemmas have an awn 1/4-3/8 inches long (from Fertig 1994, Wyoming Rare Plant Technical Committee 1995).

Oryzopsis contracta can be recognized by its contracted or stiffly spreading panicle branches, slender 1-flowered spikelets, and long-awned lemmas with short, silky white hairs. These hairs are equal or less than the length of the lemma (Fertig 1994).

It was initially described as a variety of *Oryzopsis hymenoides* (Johnson 1945) which it most closely resembles. A more detailed study by Shechter and Johnson (1966) led to recognition of this grass as a distinct species. It is intermediate between *Oryzopsis hymenoides* and *O. micrantha*, and is likely to have been overlooked or misidentified in Montana because of its overall resemblance to and habitat overlap with the former. Common indian ricegrass (*Oryzopsis hymenoides*) differs from *O. contracta* in having a wide-spreading, wavy-branched panicle, plump florets, lemmas with relatively short awns (usually <6 mm), and long silky hairs that exceed the body of the lemma (Wyoming Rare Plant Technical Committee 1994). The pedicel angles of branching are noticeably different in the field, providing a quick basis for making distinctions when matured inflorescences are present. Littleseed ricegrass (*Oryzopsis micrantha*) is distinguished by having glabrous lemmas and strictly contracted panicle branches.

Note: *Oryzopsis* (ricegrass) is a widespread genus represented by five species in Montana. In a recent revision by Barkworth (1993), it has been split into three genera. By this treatment, *Oryzopsis contracta* becomes a synonym of *Acherantherum contractum* in a genus which includes most of the former species of *Oryzopsis* in addition to the short-awned species of *Stipa* (Fertig 1994).

GEOGRAPHICAL DISTRIBUTION

Global distribution: *Oryzopsis contracta* is a regional endemic of extreme southwestern Montana, central and western Wyoming, and north-central Colorado (Fertig 1994).

Montana distribution: This species was first recognized as part of the Montana flora when an herbarium specimen deposited in RM that had been originally identified as *Oryzopsis hymenoides* was annotated by Walter Fertig, Wyoming Natural Diversity Database, to *O. contracta*. The collector, C. W. Griffin, gave the location only as Beaverhead National Forest which at the time of this 1921 collection spanned three counties. Based on this collection, the species was assigned a state rank of "SH" (known only from historic records in the state). After the field season, it was determined that a duplicate of this specimen from Beaverhead National Forest was deposited at MRC. Its collection label included additional location information, mentioning the Sheep Creek Ranger Station. This was interpreted by Peter Stickney to correspond with a site in the Tendoy Mountains, 7 miles west of Lima, in T13S, R10W, Sec. 36. The five additional sites documented in this study span the Study Area (Figure 21).

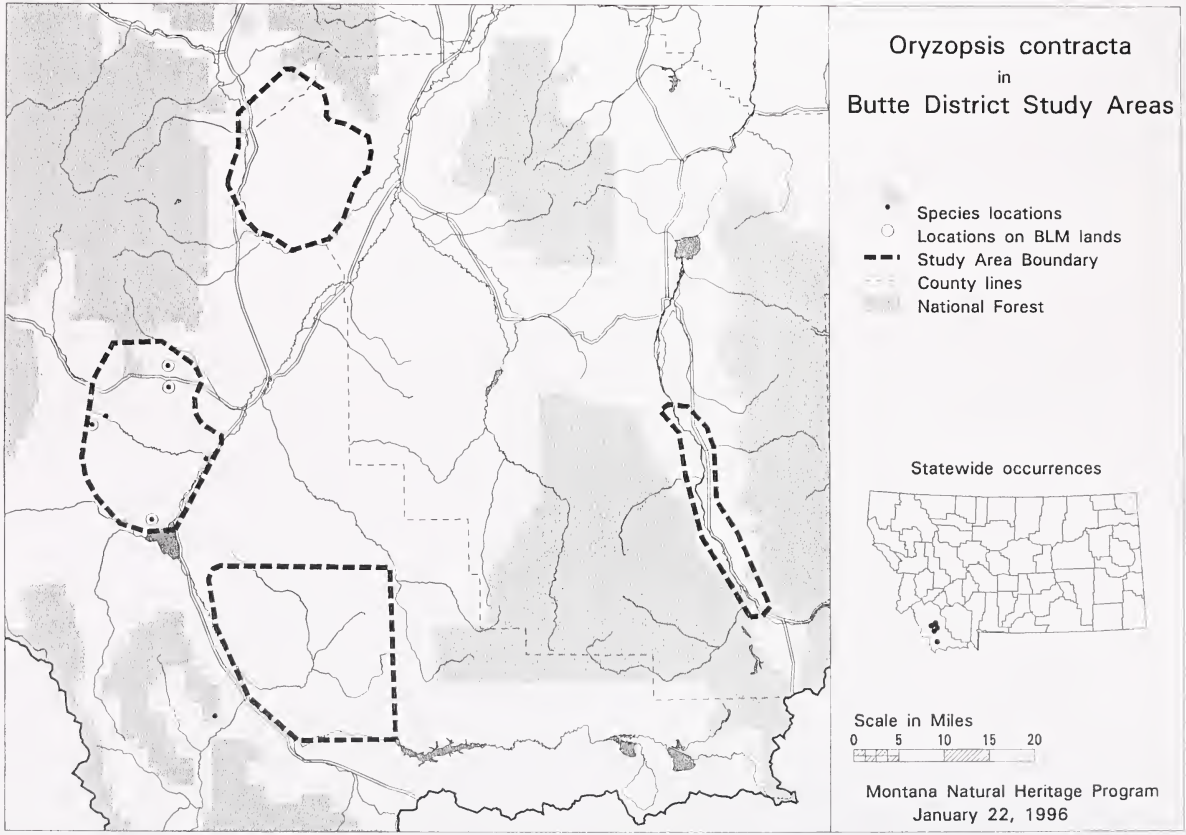
Herbarium specimens in *Oryzopsis hymenoides* folders have been checked at MONT (Rumely pers. commun.) and at MONTU (Heidel pers. obs.) without finding additional collections for annotation to *O. contracta*. Any small herbaria with collections from southwestern Montana should also be checked for misidentified specimens.

Oryzopsis contracta

Ill. by Isobel Nichols.
From Fertig 1994

Figure 20.

Figure 21


Oryzopsis contracta
in
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0 5 10 15 20
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Grasshopper distribution: Five sites were documented in the Grasshopper Creek study area in the preliminary survey (Figure 21). They span much of the Study Area and include:

Albers Spring roadside
Bannack State Park areas and separate BLM lands to west
Ermont Gulch
Grasshopper Creek mouth
Henneberry Ridge areas

HABITAT: The documented range of habitats in Montana corresponds with that in Wyoming, summarized as dry, shallow, sandy, or gravelly soils on slopes or rolling plains in open, sagebrush-grassland communities (Fertig 1994). The Montana topographic positions of *Oryzopsis contracta* are on mid to lower slopes (0-30%) with most commonly south and west aspects (Appendix D-18). In Wyoming, it is often also found on upper slopes and ridgetops on all aspects. The known range of elevation in Montana is 5400-6080 ft. Soils are consistently well-drained and light-colored, derived from various parent materials including Madison Group limestone, alluvial gravel or sand, and quartzite.

The vegetation is consistently sparse, whether found in a dry microhabitat or in a generally harsh landscape. It is dominated by *Agropyron spicatum* (Appendix D-19), with or without *Artemisia tridentata* var. *wyomingensis,* and less often with *Artemisia arbuscula*. A representative list of frequently associated species in Montana follows:

Agropyron spicatum
Arenaria kingii
Artemisia arbuscula
Artemisia frigida
Artemisia tridentata var. wyomingensis
Aster scopulorum
Bromus tectorum
Cordylanthus ramosus
Gutierrezia sarothrae
Lesquerella alpina
Phacelia linearis
Phlox longifolia
Poa secunda
Stipa comata

In the study area landscapes, it was sympatric with common indian ricegrass, which seems to have a broader ecological amplitude than contracted indian ricegrass. However, the highest population densities of the two species were in slightly different locations, perhaps corresponding with microhabitat preferences. In general, contracted indian ricegrass was lower on the catena than common indian ricegrass.

POPULATION INFORMATION: Population numbers varied by several orders of magnitude among sites, from 10-100 individuals at roadsides and slopes of the heavily grazed Grasshopper Creek mouth to 10,000+ in the Henneberry Ridge area. Individuals were widely spaced and usually consisted of a few multi-stemmed spikes (2-5).

Phenology varied little within and between populations. The first spikelets were beginning to emerge in mid-June, and the inflorescence persisted with intact spikelets through at least mid-August in the 1995 growing season, which was relatively mild and slightly late.

MANAGEMENT CONSIDERATIONS: Like common indian ricegrass, contracted ricegrass is considered to be a decreaser under livestock grazing (Fertig 1994). This notion is supported by the species' observed presence inside the fenced Bannack Cemetery versus its virtual disappearance immediately outside the Cemetery, where the land is grazed. Because of its habitat specialization, it is occasionally restricted to localized disturbance areas, e.g., the Albers Spring roadside right-of-way.

Phacelia incana A. Brand
HOARY PHACELIA
Waterleaf Family (Hydrophyllaceae)

CONSERVATION STATUS

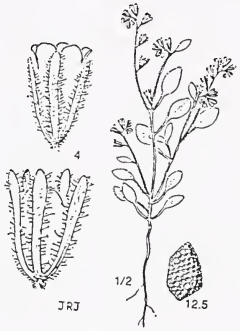
U.S. Fish and Wildlife Service: None.

Bureau of Land Management: Proposed as watch in the draft list circulated for review in 1995.

Montana Natural Heritage Program rank: G3G4 S1

DESCRIPTION: Hoary phacelia is a small annual 3-15 cm (1 1/4-6 in) tall. Its leaves are elliptical to egg-shaped and at least the lower petioles are longer than the blade. The foliage has a soft texture, covered by hairs which are mostly distinctly glandular-tipped. The mostly terminal inflorescences may appear leaf-opposed, and are elongate and usually few-flowered. The very inconspicuous flower has a 5-lobed fused white to bluish corolla, 3.5-4.5 mm long and 2-3 mm wide, which is barely longer than the 5 narrow green calyx lobes (Figure 22; Appendix D-20). There are 5 stamens and a single style. It flowers in June. The duration of flowering and extent of branching seems dependent on year-to-year climate and microhabitat moisture.

Other annual phacelias in Montana are easily distinguished from *P. incana* by their larger size and generally lobed leaves, except sometimes *P. linearis,* which has large pink flowers. Other minute annuals may superficially resemble it, e.g. species of *Collinsia, Cryptantha* and *Mimulus*, but have different floral structure, leaves, and hairs.



Phacelia incana

Cronquist et al. 1994

Figure 22.

GEOGRAPHICAL DISTRIBUTION

Global distribution: Common in eastern Nevada and western Utah and also known sporadically from northeastern Utah, northwestern Colorado, Wyoming, and central Idaho (Cronquist et al. 1984) to southwestern Montana.

Montana distribution: Southwestern Beaverhead County, including four records around the periphery of the Tendoy Mountains and two in the Grasshopper Study Area (Figure 23).

Grasshopper distribution: Bannack and Clark Canyon Reservoir areas (Figure 23).

HABITAT: Cronquist et al. (1984) describe the habitat as "stony, often calcareous slopes." Within the study area, *P. incana* grows on dry limestone ridges, often in fine soils below rubble, especially in small accumulations of leaf litter below mountain mahogany. Its elevations in the Study Area range from 6050-6200 ft, while it has been documented at 7080 ft. elsewhere in the state.

Dominant woody vegetation on these slopes is *Cercocarpus ledifolius,* often with *Artemisia tridentata* (Appendix D-21). It typically grows beneath these shrubs. A representative list of associated species include:

Agropyron spicatum
Chenopodium
Collinsia parviflora
Cryptantha watsonii
Descurainia richardsonii
Malacomia africana
Oryzopsis hymenoides
Phacelia hastata
Phacelia linearis

In the Tendoy Mountains, it was also associated with four other restricted calciphilic species: *Agastache cusickii, Hutchinsia procumbens, Mimulus suksdorfii,* and *Stanleya viridiflora* (Vanderhorst and Lesica 1994).

POPULATION INFORMATION: The two populations discovered in 1995 ranged in estimated numbers from 200 to >1000 plants. The Bannack population was recurrent in separate subpopulations, while the Clark Canyon Reservoir population seemed restricted to a single area <5 m^2, suggesting that it may have recently become established. The largest known population is in the Tendoy Mountains on BLM land and approaches or exceeds 10,000 plants.

As an annual, its numbers would be expected to vary greatly from year to year. In general, its

numbers might be expected to be higher in relatively cool, moist years -- conditions which corresponded in large part with those of the 1995 growing season.

MANAGEMENT CONSIDERATIONS: *Phacelia incana* has a very limited known distribution in Montana but it is inconspicuous and occupies habitat which is not quickly traversed. This also means that it is not readily affected by land use activities apart from mining. Invasion by exotic annuals (*Bromus tectorum* and more recently *Malacomia africana)* is on the increase in the Bannack population. This study supports previous recommendations that this species be considered as a BLM watch species.

Sphaeromeria argentea Nutt.
CHICKEN SAGE
Aster Family (Asteraceae)

CONSERVATION STATUS

U.S. Fish and Wildlife Service: None.

Montana Bureau of Land Management: Species was not on the list of proposed sensitive species included in the original draft list that was circulated, and may or may not have been added to the draft in preparation.

Montana Natural Heritage Program rank: G3 S2.

DESCRIPTION: Chicken sage is a perennial herb or subshrub with many flowering stems, 5-20 cm (2-8 in) high, and numerous short, sterile stems arising from a branched rootcrown. The alternate leaves, up to 15 mm long, are narrowly fan-shaped and usually 3-lobed at the tip. Foliage is aromatic and densely covered with appressed, gray hair. Several, short-stalked flower heads are borne on the stem tips. Each hemispheric head has 2-3 series of overlapping, membranous-margined, involucral bracts (3-4 mm high), and numerous disk flowers. Ray flowers are lacking (Figure 24; Appendix D-22). The seeds are without bristles or awns (pappus) on top.

The leaves, heads, and subshrub habit make this plant resemble a tiny sagebrush. *S. capitata* forms dense mats and has more deeply divided leaves and dense clusters of flower heads.

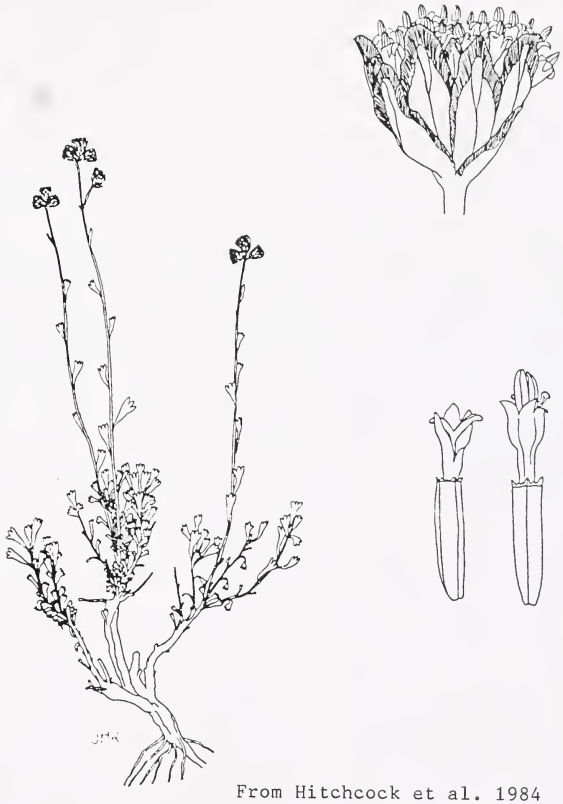
GEOGRAPHIC DISTRIBUTION

Global distribution: Central Idaho, northeast Nevada, southwest Montana, and northwest Wyoming.

Montana distribution: 12 occurrences in southwestern Beaverhead County (Figure 25).

Grasshopper distribution: There are six known populations in the Grasshopper Study Area (Figure 25).

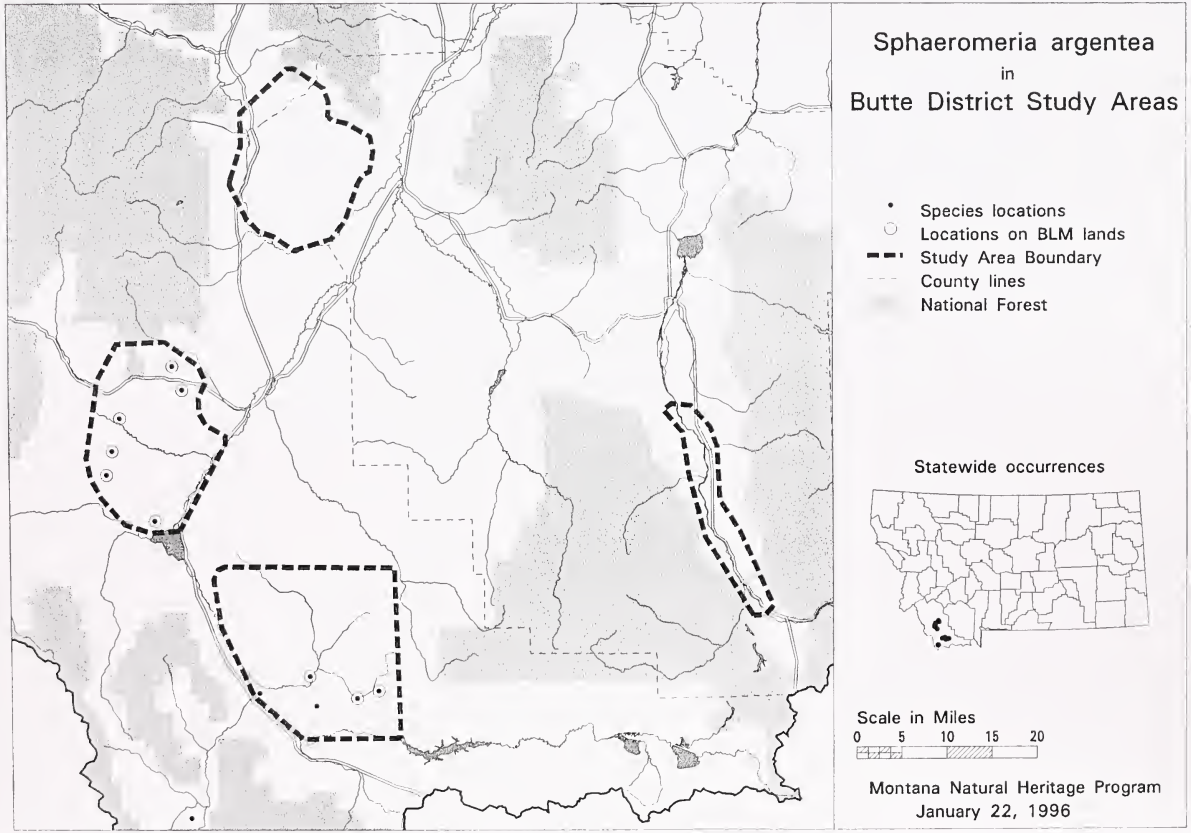
Sphaeromeria argentea



From Hitchcock et al. 1984

Figure 24.

Figure 25.


Sphaeromeria argentea
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HABITAT: *Sphaeromeria argentea* occurs in two distinct habitats in the Grasshopper Study Area:
1) low sagebrush grassland in localized sandy clay pockets within sagebrush steppe dominated by *Artemisia arbuscula/Agropyron spicatum* (Appendix D-23); and 2) limestone outcrop ridgetops and slopes covered by dry bunchgrass communities of *Agropyron spicatum*/cushion plant at the most sparsely-vegetated local extreme (Appendix D-24).

Associated species in low sagebrush grassland of the Study Area include:

Agropyron spicatum
Antennaria microphylla
Arenaria kingii
Artemisia arbuscula
Aster scopulorum
Astragalus plattensis
Crepis modocensis
Delphinium bicolor ssp. novum
Erigeron tweedyi
Festuca idahoensis
Penstemon aridus
Phlox bryoides
Poa secunda

Associated species in the limestone outcrop habitat include:

Agropyron spicatum
Arenaria kingii
Artemisia arbuscula
Artemisia frigida
Erigeron compositus
Erigeron tweedyi
Eriogonum mancum
Haplopappus acaulis
Linum lewisii
Oryzopsis hymenoides
Phlox bryoides
Townsendia nuttallii

In the Sage Creek Study Area, the species was also found in heavy soil of eroding slopes at ca. 6,300 ft.; common associated species include *Haplopappus acaulis* and *Erigeron tweedyi* (Lesica and Vanderhorst 1995). The species also occurs in this area on dry rocky bunchgrass slopes not confined to limestone parent material; common associated species include *Ceratoides lanatus, Selaginella densa, Antennaria microphylla, Astragalus miser, Haplopappus acaulis, Eriogonum*

mancum, and *Erigeron caespitosus*. Finally, the low sagebrush grassland of the Sage Creek Study Area was relatively extensive, made up of *Artemisia arbuscula /Festuca idahoensis* h.t. at ca. 6,600 ft.; common associated species include *Chrysothamnus viscidiflorus, Antennaria microphylla, Agropyron spicatum,* and *Phlox hoodii*. These settings in both study areas are arid, alkaline, and have low vegetation competition.

POPULATION INFORMATION: Population numbers range from 50 to 300 in most populations, but the Bannack area population approaches 10,000. It appears to be centered on the State Park (Vanderhorst 1995). The largest known population of the species is in Horse Prairie (Vanderhorst 1995). Numbers can be difficult to estimate because the species forms mats or aggregates that cannot be distinguished as individuals.

MANAGEMENT CONSIDERATIONS: *Sphaeromeria argentea* is a low, aromatic subshrub that did not show signs of being grazed. Some of its habitat settings are within primary range, as at the Ermont Gulch site, where the affect of trampling alters the substrate. Grazing, mining, and other activities sometimes promote the spread of exotic species and pose indirect management concerns. Mining activity is a potential threat to the species in its limestone outcrop habitat. Invasion by exotic species has not occurred in the study area sites, but potentially includes *Bromus tectorum*, *Centaurea maculosa,* and *Melilotus* spp.

This species is recommended for BLM Watch status because of the generally low population numbers, restricted range, and widespread (though low) levels of existing threats.

Taraxacum eriophorum Rydb.
ROCKY MOUNTAIN DANDELION
Aster Family (Asteraceae)

CONSERVATION STATUS:

U.S. Fish and Wildlife Service: None.

Bureau of Land Management: Proposed sensitive on the draft list that was circulated in 1995.

Montana Natural Heritage Program rank: G4 S1.

DESCRIPTION: Rocky Mountain dandelion is a stemless, herbaceous perennial with erect to ascending, glabrous, or sparsely hairy flower stalks up to 3 dm (12 in.) tall when mature. The basally-disposed, tongue-shaped leaves, 6-20 cm (2-8 in.) long, are glabrous and have wavy margins and broadly-winged petioles. The sap is milky. Solitary, terminal flower heads are borne on 1 to many leafless stalks. Each head has 2 series of erect, lance-shaped involucral bracts; the inner, 15-25 m high, are much longer than the outer. The ray flowers are yellow, and disk flowers are absent. The reddish, 4-angled, narrowly elliptic seeds (achenes) are 3-4 mm long and have a slender beak, 2-4 times as long, surmounted by numerous long, spreading, white bristles (pappus).

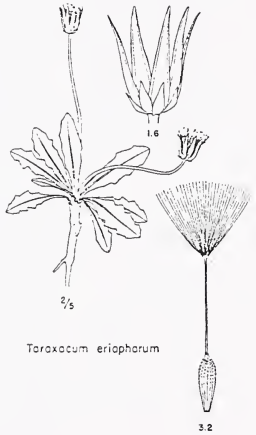
Rocky Mountain dandelion can be distinguished from the two exotic species by the erect rather than reflexed outer involucral bracts (Figure 26; Appendix D-26, D-27). It is distinguished from other native dandelions by the reddish, distinctly 4-angled achenes. A hand lens may be necessary to identify this plant.

GEOGRAPHICAL DISTRIBUTION

Global distribution: Hitchcock and Cronquist (1973) describe the distribution as "cordilleran," referring to the mountains of western North America. The species is infrequent and widely scattered on tundra in Colorado (Weber 1987) and occurs mostly in the mountains in Wyoming (Dorn 1992).

Montana distribution: Southwestern Beaverhead County (four collections) and one historic collection that cannot be mapped from the Tobacco Root Mountains in Madison County (Figure 27).

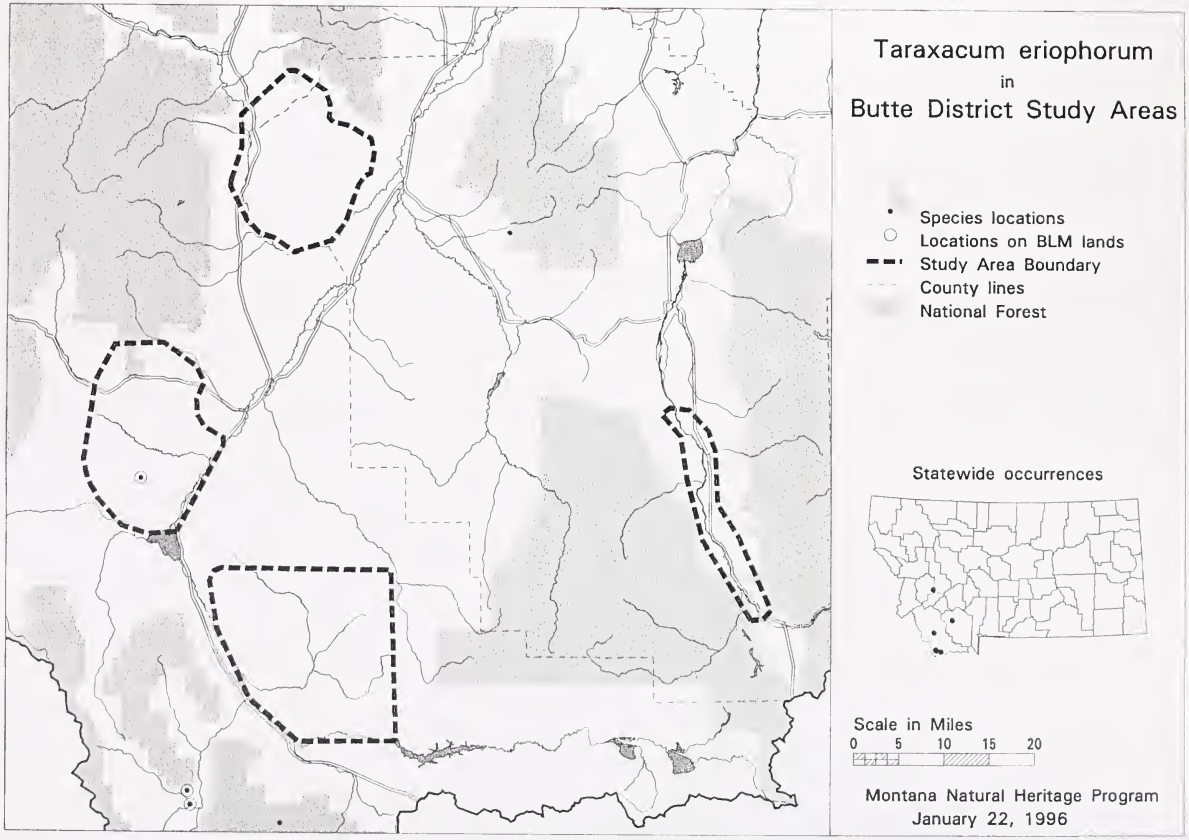
Grasshopper distribution: It was found only in one area of Henneberry Ridge (Eli Spring; Figure 27). This wetland is located entirely on BLM lands as shown in the 1993 Interagency Visit Map for southwestern Montana, but was shown to occur on private lands in the previous 1990 map.



Cronquist et al. 1994

Figure 27.

Figure 28.


Taraxacum eriophorum
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HABITAT: The Eli Spring setting occupied moist, open meadows in the spring-fed headwaters of a watercourse at 6550 ft., at the low end of species' elevation range in Montana. It was confined to the broad meadows above the Spring rather than the more degraded meadows with flowing water below. The Eli Spring setting is low and wet compared to its known habitat at the other Beaverhead County sites, where it ranges in elevation from 6920 to 9500 ft. Most sites are variously dominated by big sagebrush (*Artemisia tridentata* var. *tridentata*), Great Basin wild rye (*Elymus cinereus*), Douglas fir (*Pseudotsuga menziesii*), and Idaho fescue (*Festuca idahoensis*).

A Granite Co. collection of this species, found at >9000 ft., is from alpine turf habitat; verification of this specimen is recommended in order to better determine distribution and ecological amplitude for the species in Montana.

The Eli Spring soils are silty and saturated or semi-saturated. The long history of grazing has caused pronounced development of hummocks ca. 0.5 m high in all of the potential habitat (Appendix D-28). Between them is standing water. The *Taraxacum eriophorum* is found only on the crests of the hummocks, a narrow zone where the vegetation is less dense than the hummock tops and hummock sides. The hummock tops are dominated by *Juncus balticus* and *Muhlenbergia richardsonis*. The wet troughs between are dominated by *Carex nebrascensis* and *C. aquatilis*. Additional associated species include *Hieracium gracile, Potentilla anserina, Trifolium longipes, Antennaria* spp., and *Crepis* spp. The introduced dandelion, *Taraxacum laevigatum*, is common around the wetland borders and barely gets onto outer hummocks.

POPULATION BIOLOGY: Population size was estimated to be >1000 plants, but this may be high. Plants reproduce strictly by seed. The majority of the population was in rosette stage and not producing flowers, making population estimates more difficult and also suggesting low viability. Immature *Crepis* spp. was similar in overall appearance to the non-flowering *Taraxacum eriophorum* plants, further confounding population estimates.

MANAGEMENT CONSIDERATIONS: This species' habitat is rare in the study area, and the species is uncommon throughout its range. In the wake of a grazing history that has caused hummocks, it is not known if the habitat condition can be significantly improved. It was common to find flowering heads grazed off. Two experimental treatments might be considered. Temporary fencing above the spring would keep livestock out of its habitat during pasture use and may begin to heal over hummocks. Prescribed burning of a segment of the wetland basin in early spring or in fall could be done in order to determine whether a reduction in vegetation cover would benefit the species. With either form of treatment, some level of monitoring should be established in order to assess management response.

This study supports previous recommendations that *T. eriophorum* warrants BLM sensitive species designation in Montana.

Townsendia nuttallii Dorn
NUTTALL TOWNSEND-DAISY
Aster Family (Asteraceae)

CONSERVATION STATUS:

U.S. Fish and Wildlife Service: None.

Montana Bureau of Land Management: None.

Montana Natural Heritage Program rank: G3-S2S3.

DESCRIPTION: Nuttall Townsend-daisy is a small, cushion-forming, stemless perennial arising from a taproot and branched rootcrown. The clustered basal leaves are narrow and linear, but they expand into a small spoon-like tip. They are 5-20 mm long and 1-3 mm wide with entire margins. Foliage is densely covered with long, straight, silvery hairs. Flower heads are borne among the basal leaves. Each head has 3-4 series of narrow, pointed, green, and hairy involucral bracts, 4-9 mm long. The white to (more commonly) lavender ray flowers are ca. 8 mm long, and the yellow disk corollas are 4-5 mm long (Figure 28). The flattened, lance-shaped seeds (achenes) have only a few scattered hairs when mature and are topped by straight, stiff bristles (pappus) ca. 5-6 mm long in disk flowers and ca. 0.5 mm long in ray flowers (from Dorn 1988).

Townsendia nuttallii is very similar to *T. hookeri*, but the latter has achenes that are hairy when mature, and the pappus of both its ray and disk flowers is long. It also has leaves which are broadest at the tip, while *Townsendia hookeri* always has linear leaves. Its distribution also overlaps with *T. spathulata*, which, by comparison, has broad involucral bracts, obovate leaves, and foliage covered by loose, woolly hairs. The basal rosette leaves resemble, but are much smaller than, *Senecio canus* (shown side-by-side in Appendix D-29).

GEOGRAPHIC DISTRIBUTION

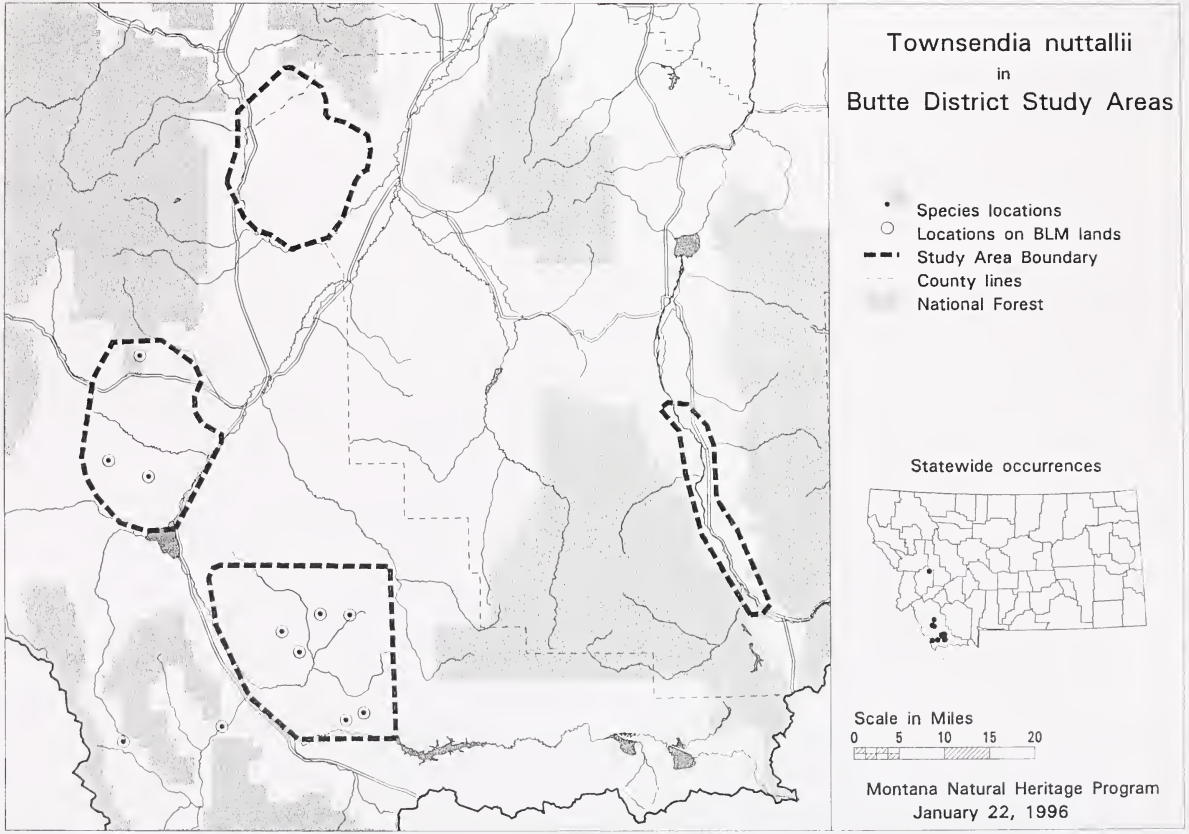
Global distribution: Western 2/3 of Wyoming, adjoining Utah, and southwest Montana; a regional endemic which Hartman et al. (1991) also expect to be Idaho.

Montana distribution: 10 occurrences in southwestern Beaverhead County and one in Granite County (Figure 28). (Note: specimens in the *Townsendia hookeri* folders have been reviewed and annotated as appropriate at both MONT and MONTU).

Grasshopper distribution: 6 occurrences scattered across the Study Area (Figure 28).

Townsendia nuttallii
Heidel #1345

Figure 28.


Townsendia nuttallii
in
Butte District Study Areas
Species locations
Locations on BLM lands
Study Area Boundary
County lines
National Forest
Statewide occurrences
Scale in Miles
0 5 10 15 20
Montana Natural Heritage Program
January 22, 1996

HABITAT: *Townsendia nuttallii* is most common on limestone outcrops with sparse bunchgrass cover (*Agropyron spicatum*/cushion plant h.t.), as found in western and southeastern portions of the Study Area, where it is limited to limestone outcrops (Appendix D-30). It was found mainly on limestone but extended onto alluvium and conglomerate bedrock substrates in the Sage Creek Study Area (Lesica and Vanderhorst 1995). The specimen label for the Granite County material indicated that it was not restricted to a given soil substrate. In Montana, its elevation ranges from 4200 ft. in Granite County to 8200 ft. in the Tendoy Mountains.

Associated species in the Study Area include:

Agropyron spicatum
Arenaria kingii
Artemisia frigida
Artemisia tridentata vaseyana
Draba oligosperma
Erigeron compositus
Eritrichium howardii
Haplopappus acaulis
Lesquerella alpina
Phlox hoodii

In the Sage Creek Study Area, the species occupied similar habitat in addition to sagebrush grasslands (*Artemisia tridentata vaseyana/Festuca idahoensis*) and grasslands (*Agropyron smithii*) of alluvial fans at 6,500-7,400 ft. Common associated species include *Poa secunda, Oxytropis lagopus, Eriogonum mancum, Phlox hoodii, Artemisia frigida, Cymopterus bipinnatus, Antennaria microphylla, Astragalus miser,* and *Penstemon aridus* (Lesica and Vanderhorst 1995). In the Tendoy Mountains, it was collected on a high rocky knob with *Lomatium cous, Polemonium pulcherrimum, Phlox hoodii, Oxytropis lagopus*, and *Saxifraga rhomboidea* (Vanderhorst and Lesica 1994).

POPULATION INFORMATION: *Townsendia nuttallii* flowers very early and is low and inconspicuous. It is sparsely distributed but occurs over large areas of widespread habitat. Thus, population size is difficult to estimate. For example, in the Henneberry Ridge area, it was found in four adjoining sections spanning a 6100-7000 ft. elevation. None of the populations had more than 3 plants, and they occupied only a fraction of what appeared to be suitable habitat. The plants observed may represent outliers from a core population that was not found. Alternately, the plants may represent widely-spaced subpopulations that make up a landscape megapopulation with an inherently sparse, sporadic pattern of distribution.

There is only one record of this species being called "fairly common" in Montana, although numbers were not estimated. The other records with quantitative estimates ranged from 1-50. The small size of most populations and the species' relatively limited global distribution are the basis for retaining Nuttall Townsend-daisy on the watch list as a vulnerable species of limited distribution, despite the number of populations and the extent of potential habitat.

This pattern of being locally widespread in very low population numbers is shared with *Astragalus platytropis* in the Big Hole Study Area, which is treated similarly.

MANAGEMENT CONSIDERATIONS: *Townsendia nuttallii* is a low-growing plant in an exposed, sparsely-vegetated setting, and it completes its life cycle early in the growing season. For these reasons, it is little-affected by livestock grazing and might respond positively to grazing that reduces competition. Mining activity is a low-level threat to the species because it is localized and the species is widely-dispersed in low densities. Invasion by exotic species is minimal or absent in the study area but poses the greatest potential direct threat to the species. Species which might invade and dominate in its habitat include *Bromus tectorum* and *Centaurea maculosa*. Grazing, mining, and other activities can occasionally promote the spread of exotic species, thus posing indirect management concerns.

UPPER MADISON VALLEY STUDY AREA

Surveys in the Upper Madison Valley Study Area expanded on the previously available information regarding two sensitive species, *Astragalus terminalis* and *Stephanomeria spinosa*; the largest concentration of occurrences and the largest population numbers known to the state were documented. While there are no immediate threats to these species in the Study Area, knapweed is beginning to spread throughout the valley; in addition, subdivision of the rangeland that represents their primary habitat is widespread outside of the BLM tracts.

The *Stephanomeria spinosa* studied is a Great Basin species at the northeastern end of its range, while the *Astragalus terminalis* is a regional endemic that spans an unusually wide range of elevations in Montana at the northern end of its distribution.

Astragalus terminalis **Wats.**
RAILHEAD MILKVETCH
Bean Family (Fabaceae)

CONSERVATION STATUS:

U.S. Fish and Wildlife Service: None.

Montana Bureau of Land Management: Proposed sensitive in the draft list circulated in 1995.

Montana Natural Heritage Program rank: G3G4-S2.

DESCRIPTION: Railhead milkvetch is a tufted perennial herb with several erect stems, 5-30 cm (2-12 in.) high, from a taproot. The leafy stems are short though caulescent. The pinnately compound leaves are 5-20 cm (2-8 in.) long with 13-21 oblong leaflets that have blunt tips. Foliage is sparsely covered with gray hairs that branch at the base and spread in opposite directions appressed to the surface of leaves or stem. Inflorescences are borne in the axils of upper leaves and have 10-30 spreading, crowded flowers that become more remote as the plant matures. White, pea-like flowers are 12-16 mm long with a reflexed upper petal and a purple-spotted lower petal. The calyx is covered with white or black hairs and is 4-5 mm long. Glabrous, cigar-shaped fruits lack a basal stem, are 3-sided in cross-section, and are 15-20 mm long (Figure 30; Appendix D-7). The alpine ecotype is much smaller than plants from the valleys (Lesica and Vanderhorst 1995).

Astragalus terminalis is similar to *A. scaphoides* and *A. atropubescens* but can be distinguished by the nearly sessile fruits, while fruits of the other 2 species have stalks that are 3-20 mm long.

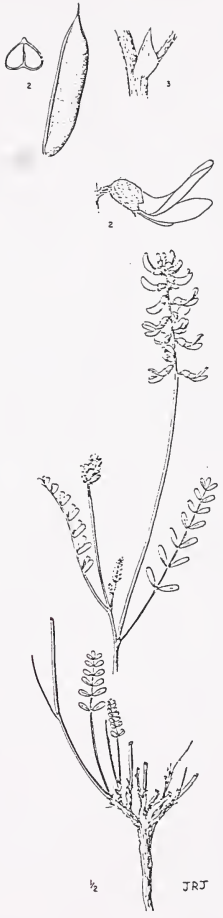
GEOGRAPHIC DISTRIBUTION

Global distribution: East-central Idaho, northwest Wyoming, and southwest Montana.

Montana distribution: 11 occurrences in southern Beaverhead and Madison counties: the Grasshopper Study Area, the Centennial Mountains, the Sage Creek Study Area, the Tendoy Mountains, and the Upper Madison Valley Study Area. Almost all sites are on BLM lands (Figure 31).

Grasshopper and Upper Madison Valley distribution: The Grasshopper Study area has 3 occurrences, and the Upper Madison Valley has 3 occurrences. The plant is also known from the Sage Creek study area (Lesica and Vanderhorst 1995; Figure 31).

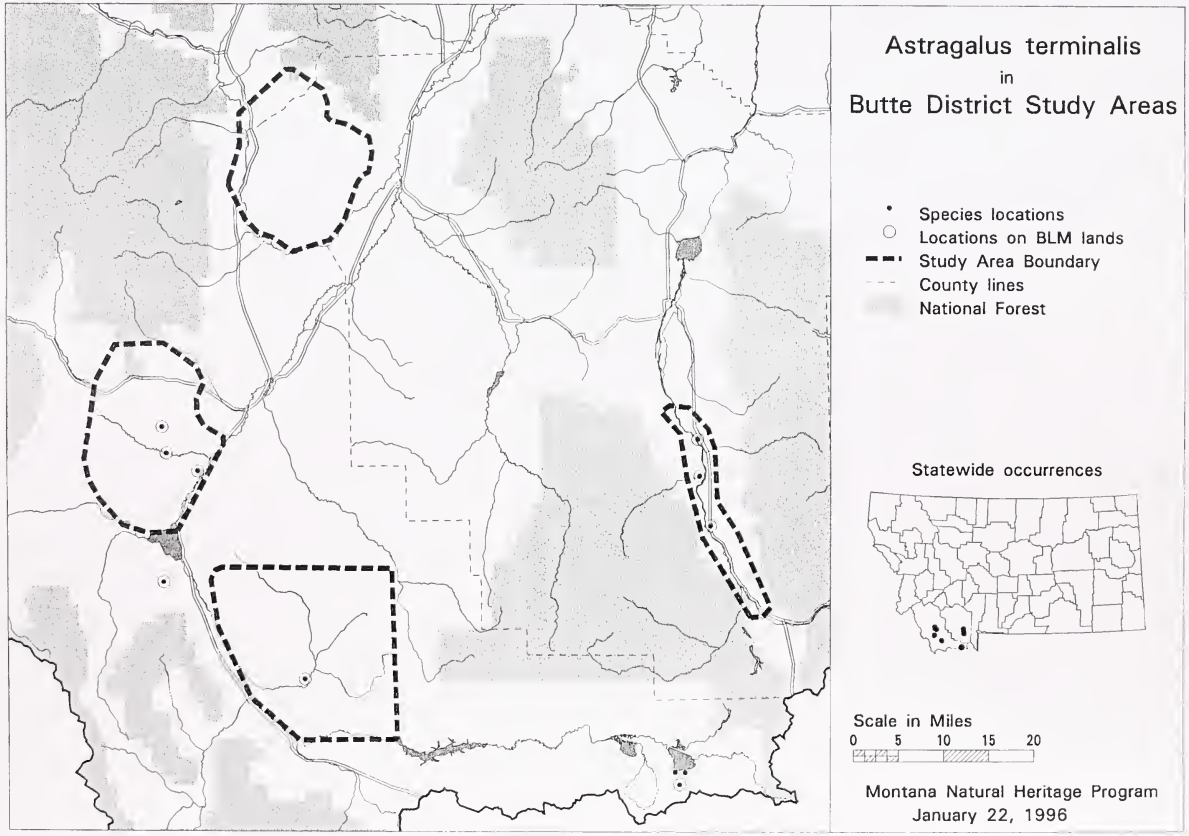
HABITAT: For the Intermountain region, Barneby (1989) describes the habitat as "open stony hillsides and benches along rivers, commonly associated with low sagebrush and calcareous bedrock." This is consistent with its habitat in the study areas, while in Montana as a whole, *Astragalus terminalis* occurs over a range of elevations from grasslands and open eroding slopes in the valleys to near timberline from 5560-9560 ft. It consistently occupies relatively barren settings that tend to be alkaline.



Hitchcock, et at. 1984

Figure 30.

Figure 31.


Astragalus terminalis
in
Butte District Study Areas
Species locations
Locations on BLM lands
Study Area Boundary
County lines
National Forest
Statewide occurrences
Scale in Miles
0 5 10 15 20
Montana Natural Heritage Program
January 22, 1996

Associated species differ somewhat according to the particular area in which this species is found in Montana. In the Grasshopper Study Area, it occupied sagebrush and grassland slopes that tended to be in secondary range between gentler slopes. In the Upper Madison Valley Study Area, it occupied grasslands in droughty but level valley bottom and terrace settings (Appendix D-8). Separate lists of associated species associated are presented below for the Grasshopper and the Upper Madison Valley study areas:

Grasshopper associated species:
Agropyron spicatum
Artemisia tridentata
Artemisia tripartita
Oxytropis besseyi
Phlox bryoides

Upper Madison Valley associated species:
Agropyron spicatum
Antennaria microphylla
Artemisia frigida
Astragalus adsurgens
Bouteloua gracilis
Chrysopsis villosa
Chrysothamnus viscidus
Grindelia squarrosa
Koeleria macrantha
Poa secunda
Selaginella densa
Senecio canus
Sphaeromeria coccinea
Stephanomeria spinosa

Outside the study areas, the species has been documented from barren clay buttes, dry subalpine meadow, and *Festuca idahoensis/Agropyron spicatum* h.t.

POPULATION INFORMATION: Population numbers in the study areas ranged from estimates of 50-10,000+. Two of the largest known populations in the state are from the Upper Madison Valley Study Area, followed by one of the Grasshopper Study Area populations and by BLM populations documented in previous studies.

MANAGEMENT CONSIDERATIONS: Distribution patterns of *Astragalus terminalis* in this study area correspond with secondary ranges at low elevations. Its densities inside an exclosure in the Upper Madison Valley Study Area were much higher than outside the exclosure (#007); additionally, many of the plants in a nearby population had inflorescences removed, probably by game. No plants were found across the cattle guard in contiguous habitat grazed by cattle. These

observations suggest that *A. terminalis* is palatable and may decrease under some livestock grazing regimes.

The largest Grasshopper Study Area population was discovered years earlier when its population numbers were much lower and livestock use was noted as heavy. The apparent rebound in numbers corresponds with improved range conditions over the 12-year interval, and reflects species' recovery potential.

The Upper Madison Valley segment contains the highest known numbers of this species for Montana, and the species is broadly distributed here. This may be due to the area's extreme aridity and its relatively low forage productivity. Increases in stocking levels or rotation frequency may detrimentally affect this species.

Knapweeds are invading this species' habitat from roadsides in the Upper Madison Valley Study Area. These exotics possess a high potential for proliferation in the milkvetch's habitat both there and in the Grasshopper Study Area.

The Dillon Resource Area harbors the great majority of this species' occurrences in Montana, including the largest of known populations. The species' viability in Montana hinges on BLM livestock and noxious weed management decisions, and it remains appropriate for designation as sensitive.

Stephanomeria spinosa (Nutt.) S. Tomb
SPINY SKELETONWEED
Aster Family (Asteraceae)

CONSERVATION STATUS:

U.S. Fish and Wildlife Service: None.

Montana Bureau of Land Management: This species was on the watch list distributed for review by the BLM in Montana in 1995.

Montana Natural Heritage Program rank: G4 S1.

DESCRIPTION: Multi-stemmed perennial, 1.5-8 dm (6-32.5 in.) tall, with spreading, spine-tipped branches from a taproot and branching caudex, with tufts of pale or brownish wool at the base. Leaves all cauline, the lower linear, entire, 3 cm (1 1/4 in.) long or less, the others reduced and scale-like. Heads are numerous, erect, pink or lavender to red-purple; seldom white (Figure 32). Involucre is 7-13 mm (3/8-11/16 in.) high with graduated bracts and well-developed outer bracts. The seed has numerous bristles (pappus) 7-9 mm (3/8-1/2 in) long that have downward pointed sidebranch bristles.

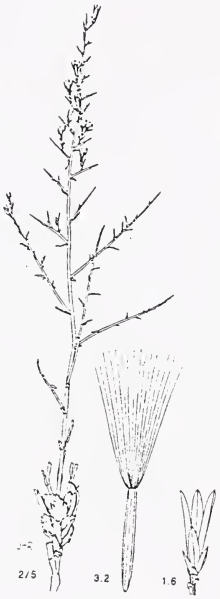
The flower resembles that of other *Stephanomeria* and *Lygodesmia* species in the state, but the conspicuously spine-tipped branches readily distinguish it (Appendix D-25).

GEOGRAPHICAL DISTRIBUTION

Global distribution: Widespread in the Great Basin, west to southern California, extending north locally to southern British Columbia and southwestern Montana.

Montana distribution: This species has been documented six times in the state (Figure 33). Five of the six records are from the upper Madison River valley centered in the study area. It is not known whether the historic records from the Ennis area and the Moose Creek Canyon area are extant. The sixth record is based on a 1952 specimen collected in the Centennial Valley.

Upper Madison Valley distribution: The three recent records span ca. 10 discontinuous miles of valley. The historic Moose Creek record is ca. 3 miles southeast, and the historic Ennis record is 15-20 miles north. The potential for habitat on private land or state land has not been evaluated. The three study area occurrences may represent the only ones for this species in Montana on public land (Figure 23).



Lygodesmia spinosa

Cronquist et al. 1994

Figure 32.

HABITAT: *Stephanomeria spinosa* occupies arid grasslands on stony loam at low elevations from ca. 5000-6400 ft (Appendix D-8). The Upper Madison Valley study area may resemble the historic Centennial Valley collection site in that both have substrate derived from coarse alluvium.

The grassland setting is predominantly *Agropyron spicatum* h.t., but *Stipa comata, Festuca idahoensis, Bouteloua gracilis,* and ground cover of *Selaginella densa* are locally co-dominant or abundant.

Associated species include the following:

Agropyron spicatum
Antennaria microphylla
Artemisia frigida
Astragalus adsurgens
Astragalus terminalis
Bouteloua gracilis
Bromus tectorum
Chrysopsis villosa
Festuca idahonis
Gutierrezia sarothrae
Koeleria macrantha
Musineon divaricatum
Oxytropis sericea
Phlox hoodii
Poa secunda
Selaginella densa
Senecio canus
Stipa comata

POPULATION INFORMATION: Population numbers in the study area range from 60 to an "extensive" population that is thought to contain more than 200 plants. These populations represent the largest known numbers for the species in Montana. The three other historic collections described the species as "rare" or did not describe its frequency at all.

The species reproduces strictly by seed and is likely to flower during most years because it is drought-tolerant.

MANAGEMENT CONSIDERATIONS: The Dillon Resource Area harbors the only known extant occurrences of this species in Montana, with possible extension onto the Wall Creek WMA. We have no evidence to indicate that it is affected negatively or positively by livestock management practices. The geographic restriction of the species and the encroachment of knapweed upon its habitat provides the basis for considering its designation as a BLM watch species.

DISCUSSION

This study narrows a gap in the biodiversity picture for the exceptionally diverse Dillon Resource Area. It also helps to close information gaps for little-known species in Montana and builds upon the BLM status recommendations presented in earlier Dillon Resource Area reports for other species. It strengthens the available information-base for making sound resource management decisions as highlighted below by species and by area.

Astragalus platytropis and *Townsendia nuttallii* are relatively common in the Big Hole and Grasshopper study areas, respectively. Although populations are often small for the former and habitat is somewhat restricted for the latter, both species are widespread and have few, if any, apparent threats. The latter is most widespread in the Sage Creek Study Area (Lesica and Vanderhorst 1995).

Significant new information was collected on two species, *Kochia americana* and *Oryzopsis contracta*. Both were virtually unknown in Montana before this study and not documented from BLM lands. Preliminary information indicates that they have been overlooked, are present in substantial numbers, and are subject to limited threats. It is not appropriate to consider these species for BLM designation as sensitive, but they are currently being left on the list of Montana Species of Special Concern with a state rank of "SU" (status unknown) while information is being collected to document their status elsewhere in the state.

The largest known Montana populations of three endemics were documented, shedding light on the habitat requirements and complementary management actions (*Astragalus scaphoides*, *Lesquerella pulchella,* and *Lomatium attenuatum*). The largest known population of one peripheral species was similarly documented (*Stephanomeria spinosa*).

New information was collected for several of the species in a setting of human-caused disturbance, helping to reveal natural dispersal patterns, habitat requirements, and tolerance to disturbance (*Erigeron linearis, Lesquerella pulchella,* and *Lomatium attenuatum*).

Additional distribution information was collected on species that had once been considered designated as State Species of Special Concern; several of these remain on the Watch List because of their limited distribution (*Arenaria kingii, Astragalus lentiginosus,* Delphinium bicolor ssp. novum, Eriogonum ovalifolium* var. *nevadense, Gentiana aquatica,* Gilia inconspicua, Mimulus suksdorfii*, Pediocactus simpsonii, Sphaeromeria capitata,** and *Stanleya viridiflora*).

The study areas contain a broad array of terrestrial, low elevation sensitive species and sensitive species habitats of southwestern Montana, particularly the Grasshopper Study Area. But all three of the study areas contained special features that warrant mention. The Big Hole Study area represents the center of distribution for *Astragalus platytropis* in the state, and has select grassland and steppe allotment areas in excellent condition. Most of the fieldwork was

conducted east of Highway 15 where there are large blocks of contiguous BLM lands. Lands west of Highway 15 were not included apart from initial efforts to relocate *Phacelia scopulina.* Because the intact condition or particular type of outcrop habitat was not found, we did not locate sensitive species in wetlands or on limestone outcrops. Nevertheless, when conducting project reviews, these habitats should still be recognized as potentially harboring sensitive species. Access was not obtained to survey McCartney Mountain, which would have been appropriate to include since its stratigraphy and forest and meadow habitats differ from the remainder of the study area.

The Grasshopper Study Area has the largest known populations for several globally rare plants in the state, including *Astragalus scaphoides, Lesquerella pulchella*, *Lomatium attenuatum,* and *Oryzopsis contracta.* It is also central among *Penstemon lemhiensis* occurrences in Montana; these occurrences had been addressed in a management strategy (Elzinga 1995). A wide range of upland habitats support sensitive species across this Study Area, though the greatest number are on limestone outcrops. The Bannack locale harbors a noteworthy concentration of rare species that potentially affords both special conservation and public education opportunities. The

Upper Madison Area has the largest known populations for two rare state plants, *Astragalus terminalis* and *Stephanomeria spinosa.* They are in relatively extensive valley bottom habitat, but little of this habitat is on public land. Several diverse, largely-intact, spring-fed wetlands were documented, representing significant contributions to species and landscape diversity in the arid valley bottom setting; nevertheless, no rare species were discovered in the late-season wetland setting surveys.

Greatest immediate management concerns in all three of the study areas are recent incursions of noxious weeds, particularly spotted knapweed (*Centaurea maculosa*), and less frequently, leafy spurge (*Euphorbia esula*). Special effort should be taken to aggressively control weed management and to keep watch on activities that potentially foster the spread of noxious weeds (road maintenance, off-road travel, and other forms of recreation, mining, or range development activities).

Special management attention should be given to globally rare species that are now restricted to only fractions of their potential habitat, on which they had previously been widespread: *Astragalus scaphoides* and *A. terminalis.* The localized abundance of these species in the study areas is interpreted to represent excellent range condition and non-conflicting livestock management to date. Existing allotment management practices do not provide a guarantee for survival; the case for status quo management and impacts to these species are therefore appropriate to address in all future reviews of allotment management plans, particularly critical at the largest of their populations.

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Schassberger, L. A. 1991. Status review of *Lesquerella carinata* and *Lesquerella paysonii*. Unpublished report to the Deerlodge National Forest. Montana Natural Heritage Program, Helena. 40 pp.

Shechter, Y. and B. L. Johnson. 1966. A new species of *Oryzopsis* (Graminae) from Wyoming. *Brittonia* 18:342-347.

Shelly, J. S. 1987. Status review of *Penstemon lemhiensis*, Beaverhead and Bitterroot National Forests. Montana Natural Heritage Program, Helena. 72 pp.

Shelly, J. S. 1990. Status review update and establishment of demographic monitoring studies: *Penstemon lemhiensis*. Unpublished report to the U.S. Forest Service, Missoula. Montana Natural Heritage Program, Helena. 61 pp.

USDC National Oceanic and Atmospheric Association. 1982. Monthly normals of temperature, precipitation and heating and cooling degree days, Montana, 1951-1980. National Climate Center, Ashville, NC.

USDI Bureau of Land Management. 1995. Draft list of sensitive, watch and peripheral species in Montana. Unpublished report. 5 pp.

USDI Fish and Wildlife Service. 1993. Plant taxa for listing as Endangered or Threatened Species: Notice of Review. *Federal Register* 58(188):51144-51190.

Vanderhorst, J. 1995. Report on the conservation status of *Lesquerella carinata* var. *languida*, a candidate threatened species. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena. 45 pp. plus appendices.

Vanderhorst, J. 1995. Survey of Bannack State Park and vicinity for Montana plant species of special concern. Unpublished report to Bannack State Park. Montana Natural Heritage Program, Helena. 43 pp.

Vanderhorst, J. 1995. Sensitive plant survey in the Horse Prairie Creek drainage, Beaverhead County. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena. 69 pp.

Vanderhorst, J. and P. Lesica. 1994. Sensitive plant survey in the Tendoy Mountains, Beaverhead County, MT. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program. 59 pp. plus appendices.

Weber, W. A. 1987. Colorado flora: western slope. Colorado Associated University Press, Boulder, CO. 530 pp.

Willoughby, J., E. Hastey, K. Berg, P. Dittberner, R. Fellows, R. Holmes, J. Knight, B. Radtkey, and R. Rosentretter. 1992. Rare plants and natural communities: a strategy for the future. Bureau of Land Management, Washington, D.C.

Wyoming Rare Plant Technical Committee. 1995. Wyoming rare plant field guide. Cheyenne, WY.

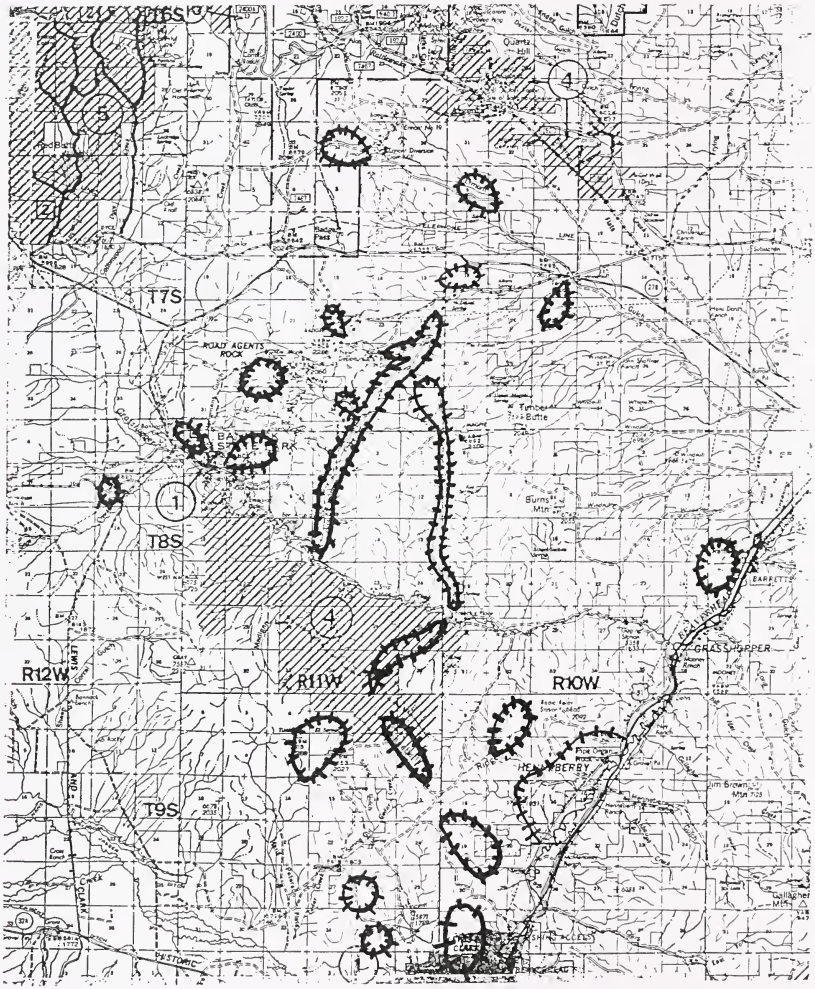
Appendix A. Preliminary list of survey target species occurring in or adjoining the study areas.

Study Area/Species target[1]	Phenology
Big Hole	
Arabis fecunda	May - June
Astragalus platytropis	May - June
Carex parryana ssp. idahoa	July - August
Erigeron asperugineus	July
Penstemon lemhiensis	late June - early July
Phacelia scopulina	June
Thlaspi parviflorum	late June - early July
Grasshopper	
Astragalus scaphoides	mid June - early July
Astragalus terminalis	July
Erigeron linearis	June
Lesquerella pulchella	early June
Lomatium attenuatum	May-early June
Penstemon lemhiensis	late June - early July
Sphaeromeria argentea	mid June - early July
Thelypodium paniculatum	June - early July
Upper Madison Valley	
Astragalus terminalis	July
Castilleja gracillima	July - August
Castilleja longispica	June - July
Eleocharis rostellata	July-August
Stephanomeria spinosa	August

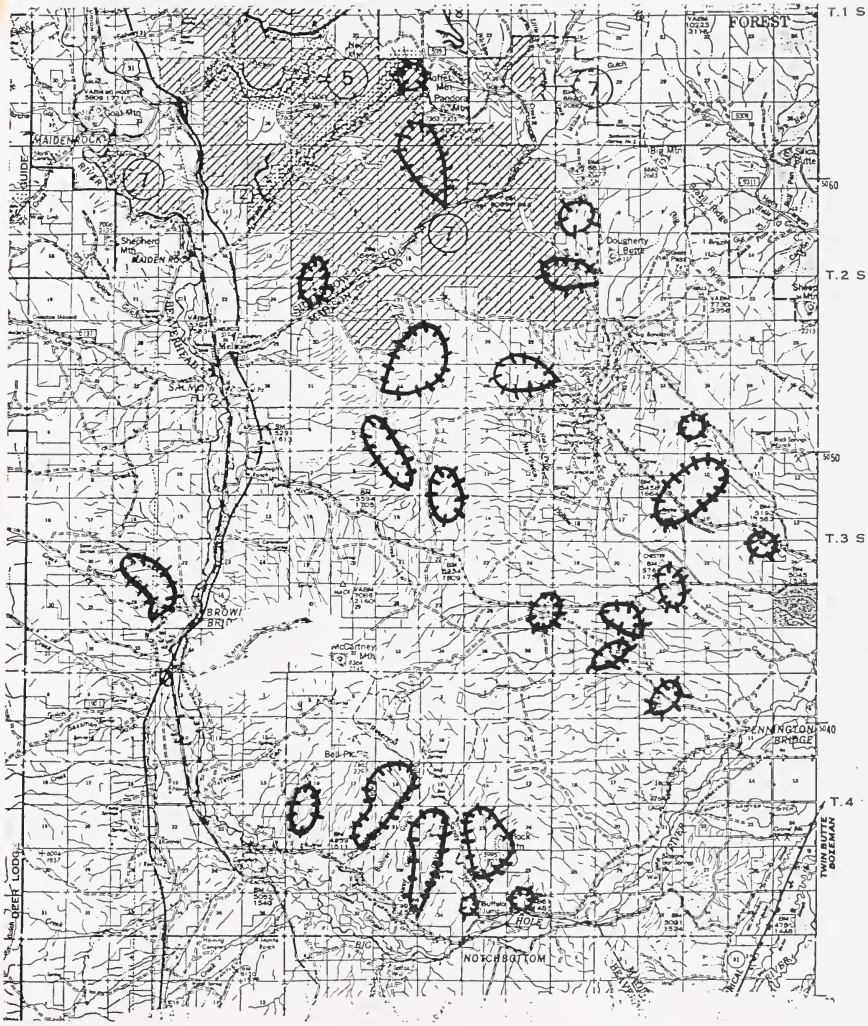
[1]Species which have previously been documented in nearby study areas were also sought, without planning the fieldwork around them as tentative targets.

Appendix B. AREAS SURVEYED.

Grasshopper Study Area



Big Hole Study Area



Upper Madison Valley Study Area

Appendix C. ELEMENT OCCURRENCE PRINT-OUTS AND MAPS.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.001
Element occurrence type:

Survey site name: BON ACCORD BENCH
EO rank: A
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	08	SE4; 9 SW4

Precision: S
Survey date: 1984-06-11 Elevation: 5900 -
First observation: 1983 Slope/aspect: 13% / SW
Last observation: 1984-06-11 Size (acres): 30

Location:
2 KM SOUTHEAST OF BANNACK.

Element occurrence data:
CA. 200-300 INDIVIDUALS; NO SIGNS OF RECENT LIVESTOCK GRAZING; 30% OF REPRODUCTIVE PLANTS PRODUCED FRUIT (LESICA, UNPUBLISHED).

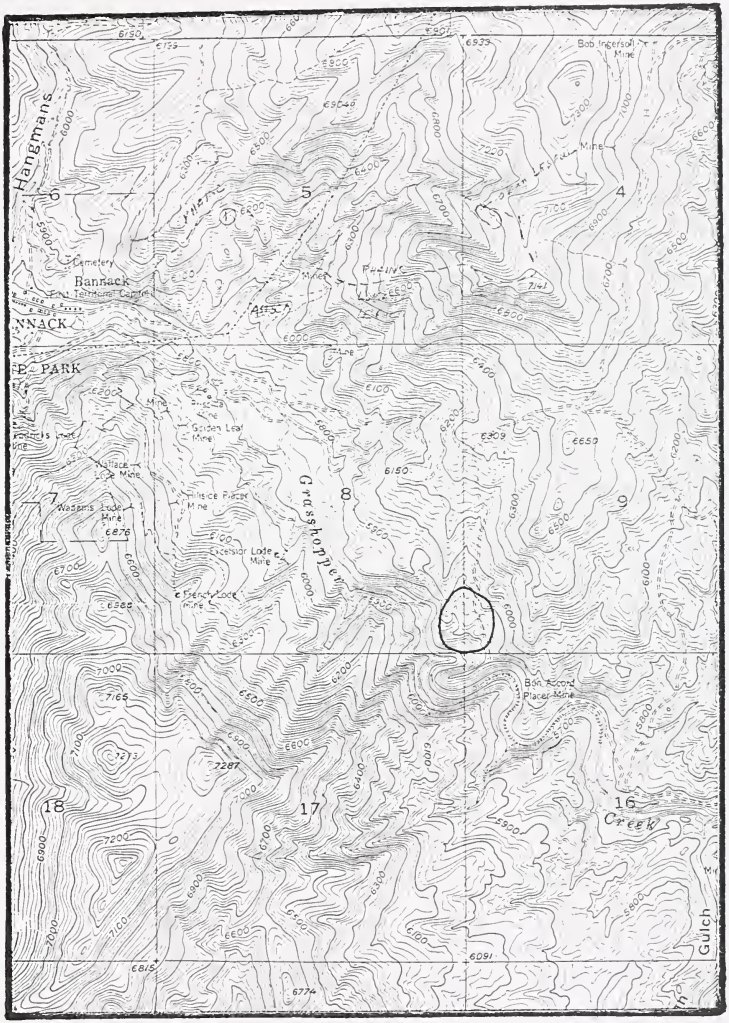
General site description:
GRAVELLY SILT FROM LIMESTONE PARENT MATERIAL; WITH ARTEMISIA TRIDENTATA, A. NOVA, AGROPYRON SPICATUM, AND STIPA COMATA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:

Information source: LESICA, P. 1984. REPORT ON THE CONSERVATION STATUS OF ASTRAGALUS SCAPHOIDES, A CANDIDATE THREATENED SPECIES. UNPUBLISHED REPORT TO THE U.S. FISH AND WILDLIFE SERVICE, DENVER, CO, 20 PP. PLUS APPENDICES.

Specimens: LESICA, P. (2697, 2988). 1983, 1984. (MONTU).


Hangmans
Bannack
First Territorial Capitol
NNACK
PARK
Cemetery
Bob Ingersoll Mine
Mine
Russell Mine
Golden Leaf Mine
Wallace Lode Mine
Hillside Placer Mine
Excelsior Lode Mine
French Lode Mine
Bon Accord Placer Mine
Grasshopper
Creek
Gulch
4
5
6
7
8
9
16
17
18
6150
6933
7141
6309
6650
6150
6876
6585
7165
7287
6815
6774
6091

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.002
Element occurrence type:

Survey site name: COLD SPRING CREEK
EO rank: C
EO rank comments: SEE U84LES01MT.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	15	SW4; 16 E2SE4

Precision: S
Survey date: 1984-06-11 Elevation: 5750 -
First observation: 1984 Slope/aspect: 27% / SW
Last observation: 1984-06-11 Size (acres): 30

Location:
"LOCATED 2 KM SOUTHEAST OF THE BON ACCORD SITE" (EO #001); CA. 5 KM SE. OF BANNACK.

Element occurrence data:
CA. 100 INDIVIDUALS; EVIDENCE OF LIGHT TO MODERATE LIVESTOCK GRAZING; 25% OF REPRODUCTIVE PLANTS PRODUCED FRUIT (LESICA, UNPUBLISHED).

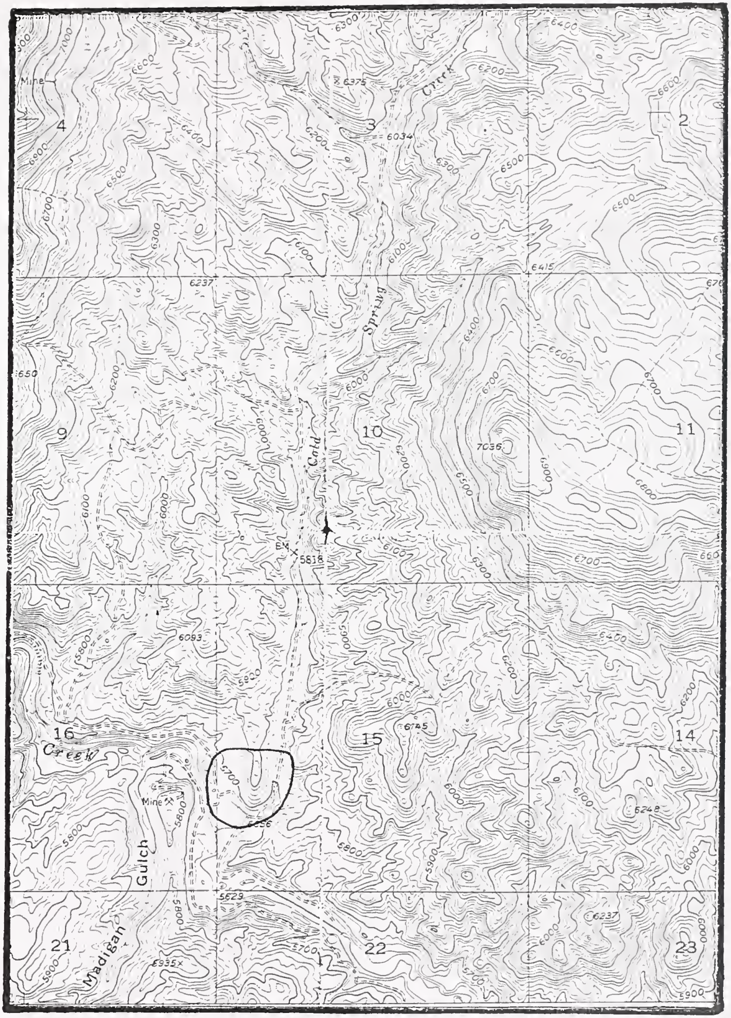
General site description:
PARENT MATERIAL UNKNOWN; WITH ARTEMISIA TRIDENTATA, A. FRIGIDA, AGROPYRON SPICATUM, STIPA COMATA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:

Information source: LESICA, P. 1984. REPORT ON THE CONSERVATION STATUS OF ASTRAGALUS SCAPHOIDES, A CANDIDATE THREATENED SPECIES. UNPUBLISHED REPORT TO THE U.S. FISH AND WILDLIFE SERVICE, DENVER, CO, 20 PP. PLUS APPENDICES.

Specimens:


Mine
4
3
2
Creek
Spring
Cold
9
10
11
7036
BM
5818
6093
16
Creek
15
14
Mine
Gulch
Madigan
21
22
23
6745
6248
6237
5629
6375
6034
6415
6237

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.003
Element occurrence type:

Survey site name: BANNACK
EO rank: C
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	05	SW4

Precision: S
Survey date: 1983-06-27 Elevation: 5800 -
First observation: 1983 Slope/aspect: 0-20% / SOUTH
Last observation: 1995-06-14 Size (acres): 2

Location:
FROM BANNACK GO EAST 0.5 MI. ALONG GRASSHOPPER CR. AND TURN NORTH ON OLD MINING ROAD FOR 0.1 MILE.

Element occurrence data:
1995: OVER 100 PLANTS NEARING PEAK FLOWERING. VIGOROUS GROWTH. LIGHT BROWSING POSSIBLY BY HORSES. 1988: 11-50 PLANTS. SEED PRODUCTION EST. AT 5-10% OF MAXIMUM.

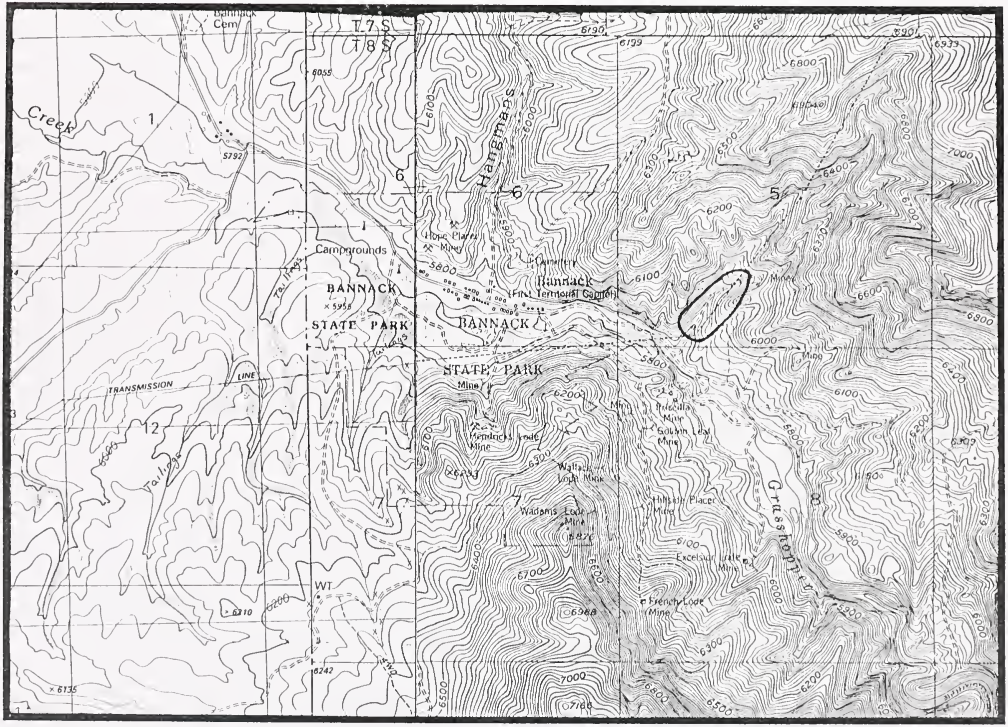
General site description:
ON EDGE OF SMALL DRAINAGE, HEAVY SOIL WITH GRAVEL EXTENDING UP LOWER GRAVEL SCREE SLOPE; ASSOCIATED WITH ARTEMISIA TRIDENTATA, AGROPYRON SPICATUM, STIPA COMATA.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
SITE IS AN OLD MINING CLAIM. OBSERVED IN 1995 BY B. HEIDEL.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: LESICA, P. (2673). 1983. MONTU.


Bannack Cem
T 7 S
T 8 S
Creek
Hangmans
Hope Placer Mine
Campgrounds
Cemetery
Bannack
(First Territorial Capitol)
BANNACK
STATE PARK
BANNACK
STATE PARK
TRANSMISSION
LINE
Tailings
Hendricks Lode Mine
Wallace Lode Mine
Wadams Lode Mine
Priscilla Mine
Golden Leaf Mine
Hillside Placer Mine
Excelsior Lode Mine
Frenchy Lode Mine
Grasshopper
WT

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.004
Element occurrence type:

Survey site name: SHEEP CORRAL GULCH
EO rank: AB
EO rank comments: LARGE POPULATION, FAIR TO GOOD CONDITION RANGELAND.

County: BEAVERHEAD

USGS quadrangle: GRANT

Township:	Range:	Section:	TRS comments:
008S	012W	26	27; 35

Precision: S
Survey date: 1986-06-21 Elevation: 6400 -
First observation: 1983 Slope/aspect: 7% / SW
Last observation: 1986-06-21 Size (acres): 150

Location:
NEAR HEAD OF SHEEP CORRAL GULCH, CA. 6.5 AIR MILES NORTH OF GRANT.

Element occurrence data:
EST. 1500-2000+ INDIVIDUALS, 2 SUBPOPULATIONS; EVIDENCE OF LIVESTOCK GRAZING MODERATE TO HEAVY IN 1984, LIGHT IN 1986; CATTLE OBSERVED ON THE SITE IN EARLY JUNE, 1984; 13% OF REPRODUCTIVE PLANTS PRODUCED FRUIT (LESICA, UNPUBLISHED).

General site description:
DIABASE PARENT MATERIAL; WITH ARTEMISIA TRIDENTATA, GUTIERREZIA SAROTHRAE, AGROPYRON SPICATUM, AND ORYZOPSIS HYMENOIDES.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
STATE LAND - UNDESIGNATED

Comments:

Information source: SHELLY, J. S. 1986. [FIELD SURVEYS IN BEAVERHEAD COUNTY OF 18-22 JUNE.]

Specimens: LESICA, P. (2976). 1984. MONTU.
SHELLY, J. S. (1154) AND G. V. KING. 1986. MONTU.


Water Tank
6302
6329
27
26
25
6304
6278
6351
34
Gulch
35
36
4WD
6184
6958
4WD
Bench Well
3
2
1
4WD

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.007
Element occurrence type:

Survey site name: MOUTH OF GRASSHOPPER CREEK
EO rank: X
EO rank comments: NOT RELOCATED DURING 1983 FIELD SURVEY BY LESICA. PRESUMED EXTIRPATED.

County: BEAVERHEAD

USGS quadrangle: DALYS

Township:	Range:	Section:	TRS comments:
008S	010W	25	26; 27

Precision: G
Survey date: 1983 Elevation: 5300 -
First observation: 1947 Slope/aspect:
Last observation: 1960-06-10 Size (acres): 0

Location:
GRASSHOPPER CREEK W. (SIC) OF DILLON; HITCHCOCK RECORD SAYS "12 MILES SOUTH OF DILLON."

Element occurrence data:

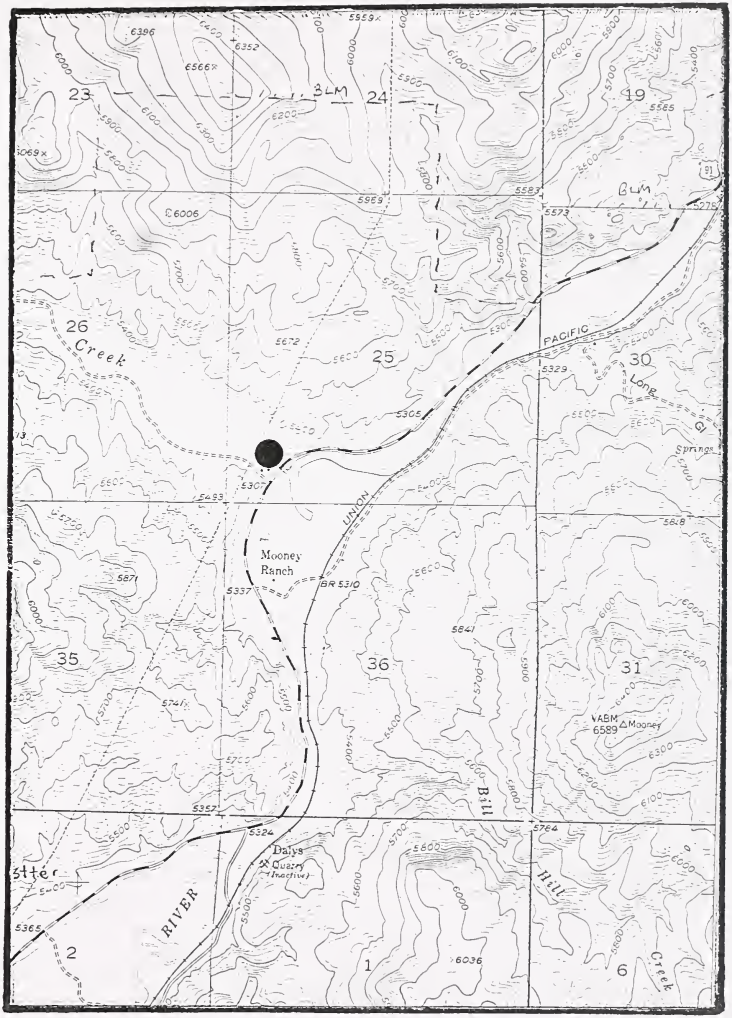
General site description:
SAGEBRUSH HILLS.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
EXACT LOCATION UNKNOWN.

Information source: LESICA, P. 1984. THE DISTRIBUTION AND REPRODUCTION EFFORT OF THE RARE PLANT ASTRAGALUS SCAPHOIDES IN MONTANA AND IDAHO. UNPUBLISHED REPORT PREPARED FOR THE NATURE CONSERVANCY, BIG SKY FIELD OFFICE, HELENA, MT. 14 PP.

Specimens: BYERSON, D. (835). 1960. MONT. WTU.
HITCHCOCK, C. L. (15799). 1947. NY. MONT. WTU.



BLM
23
24
19
26
Creek
25
30
Long
Springs
PACIFIC
UNION
Mooney
Ranch
BR 5310
35
36
31
VABM
6589
Mooney
Bill
Hill
Dalys
Quarry
(Inactive)
RIVER
2
1
6
Creek

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.008
Element occurrence type:

Survey site name: CLARK CANYON SCHOOL SECTION
EO rank: B
EO rank comments: MAJOR POPULATION COMPLEX WITH MANAGEMENT CONCERNS.

County: BEAVERHEAD

USGS quadrangle: ELI SPRING

Township:	Range:	Section:	TRS comments:
009S	011W	25	SW4SW4; 35 NE4NE4; 36 NW4NW4
009S	011W	26	NW4, SW4

Precision: S
Survey date: 1986-06-22 Elevation: 5860 - 6280
First observation: 1986 Slope/aspect:
Last observation: 1995-06-15 Size (acres): 70

Location:
CA. 2.25 AIR MILES NORTH OF CLARK CANYON RESERVOIR, ALONG DIRT ROAD HEADING NORTH TO HENNEBERRY RIDGE; CA. 3 AIR MI. W. OF I-15, CA. 18 MILES SW OF DILLON.

Element occurrence data:
6/15/95: ADDITIONAL SUBPOPULATIONS IN SEC. 26 WITH OVER 300 PLANTS. THE POPULATION SEGMENTS ON BLM LAND HAVE EXCELLENT VIGOR AND FLOWERING. ON THE MORE HEAVILY GRAZED STATE LAND THERE IS ALMOST NO FLOWERING, AND DENSITY IS LOW. 1986: CA. 1500-2000 PLANTS, EARLY TO MATURE FRUIT; CATTLE TRAILS TRAVERSE A PORTION OF THE HABITAT; A FEW PLANTS HAD BEEN GRAZED; MANY ACRES OF POTENTIAL HABITAT IN THE AREA; MORE SURVEY WORK NEEDED. 6/13/94: 60% VEGETATIVE, 40% EARLY FRUIT, 1000-10,000 ESTABLISHED PLANTS, SOME BROWSED HEADS. 6/20/94: 2 SUBPOPULATIONS TO NORTHWEST WITH CA. 100 PLANTS, 50% FLOWERING, 50% FRUITING.

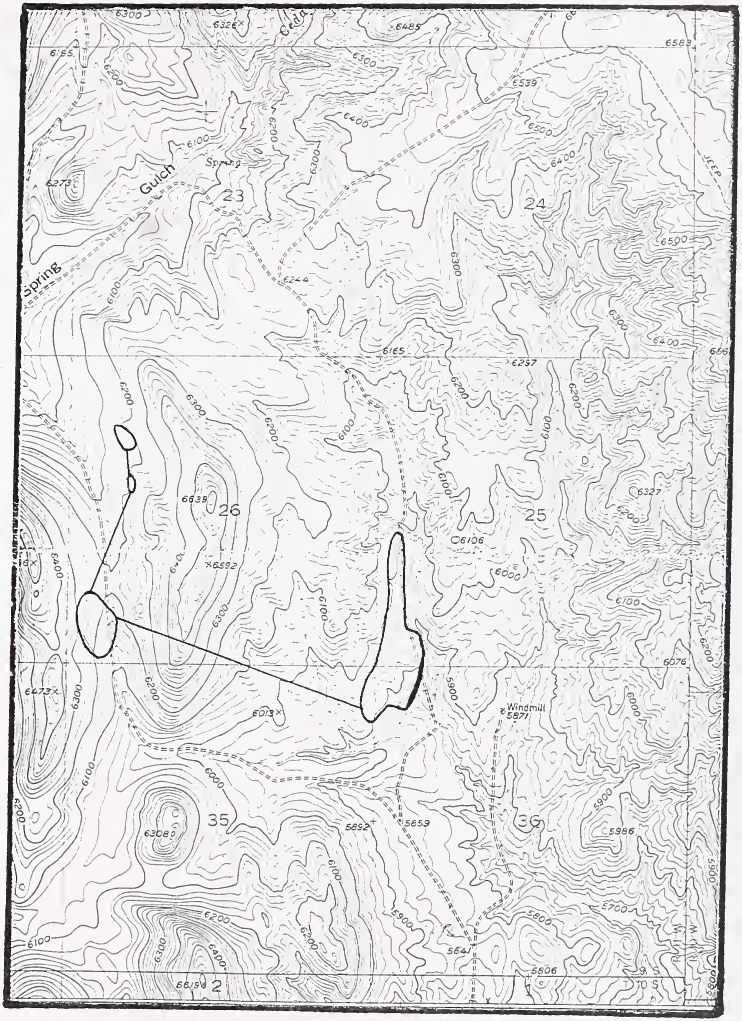
General site description:
GRAVELLY LOAM SOILS; ARTEMISIA TRIDENTATA/STIPA COMATA, W/ AGROPYRON SPICATUM, ARTEMISIA FRIGIDA, LEPTODACTYLON PUNGENS, ORYZOPSIS HYMENOIDES, PHACELIA LINEARIS, OPUNTIA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
STATE LAND - UNDESIGNATED

Comments:
SPOTTED KNAPWEED IS ENCROACHING IN THE CORE POPULATION ALONG THE ROADWAY IN SEC. 25. OBSERVED IN 1995 BY B. HEIDEL.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: SHELLY, J. S. (1157) & G. V. KING. 1986. MONTU.
VANDERHORST, J. (5200). 1994. SPECIMEN #119505. MONT.



Spring
Gulch
Spring
23
24
26
25
35
36
2
Windmill
5871
JEEP
6539
6592
6106
6165
6244
6539
6485
6583
6273
6308
6013
5892
5859
5986
6076
6327
5641
5806

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.009
Element occurrence type:

Survey site name: GRASSHOPPER CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	08	

Precision: M
Survey date: Elevation: 5900 -
First observation: 1983 Slope/aspect:
Last observation: 1983-06-26 Size (acres): 0

Location:
0.25 MILE NORTH OF GRASSHOPPER CREEK. (CA. 1.5 MILES SOUTHEAST OF BANNACK.)

Element occurrence data:
UNCOMMON.

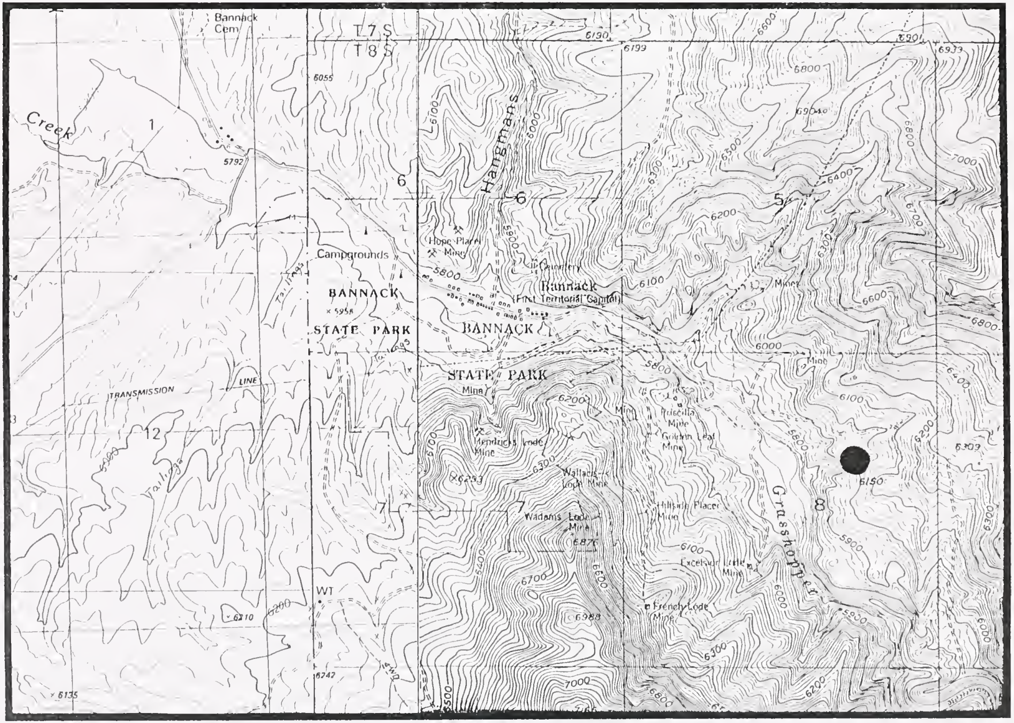
General site description:
ON A LOWER EAST-FACING SLOPE OF A SIDE DRAINAGE, CALCAREOUS PARENT.
ASSOCIATED SPECIES: ARTEMISIA TRIDENTATA, AGROPYRON SPICATUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
HERBARIUM LABEL READS "5700 FT."; OCCURRENCE MAPPED AT 5900 FT.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: LESICA, P. (2673). 1983. SPECIMEN #92922. MONTU. (MRPP CARD)..


Bannack Cem
T 7 S
T 8 S
Creek
Hangmans
Hope Placer Mine
Campgrounds
Cemetery
Bannack (First Territorial Capital)
BANNACK STATE PARK
BANNACK
STATE PARK
TRANSMISSION LINE
Tailings
Hendricks Lode Mine
Wallace Lode Mine
Wadams Lode Mine
Priscilla Mine
Golden Leaf Mine
Hillside Placer Mine
Excelsior Lode Mine
French Lode Mine
Grasshopper
WT

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.014
Element occurrence type:

Survey site name: HENNEBERRY FAS
EO rank: D
EO rank comments: HEAVILY GRAZED AND TRAMPLED.

County: BEAVERHEAD

USGS quadrangle: DALYS

Township:	Range:	Section:	TRS comments:
009S	010W	10	SW4

Precision: S
Survey date: 1994-06-20 Elevation: 5400 - 5640
First observation: 1994-06-20 Slope/aspect: 0-10% / SOUTH
Last observation: 1994-06-20 Size (acres): 30

Location:
FIRST DRAINAGE OF BEAVERHEAD RIVER SOUTH OF PIPE ORGAN CREEK, WEST OF FRONTAGE ROAD, HWY 91, AND BEAVERHEAD RIVER.

Element occurrence data:
<50 PLANTS, FRUIT PRESENT.

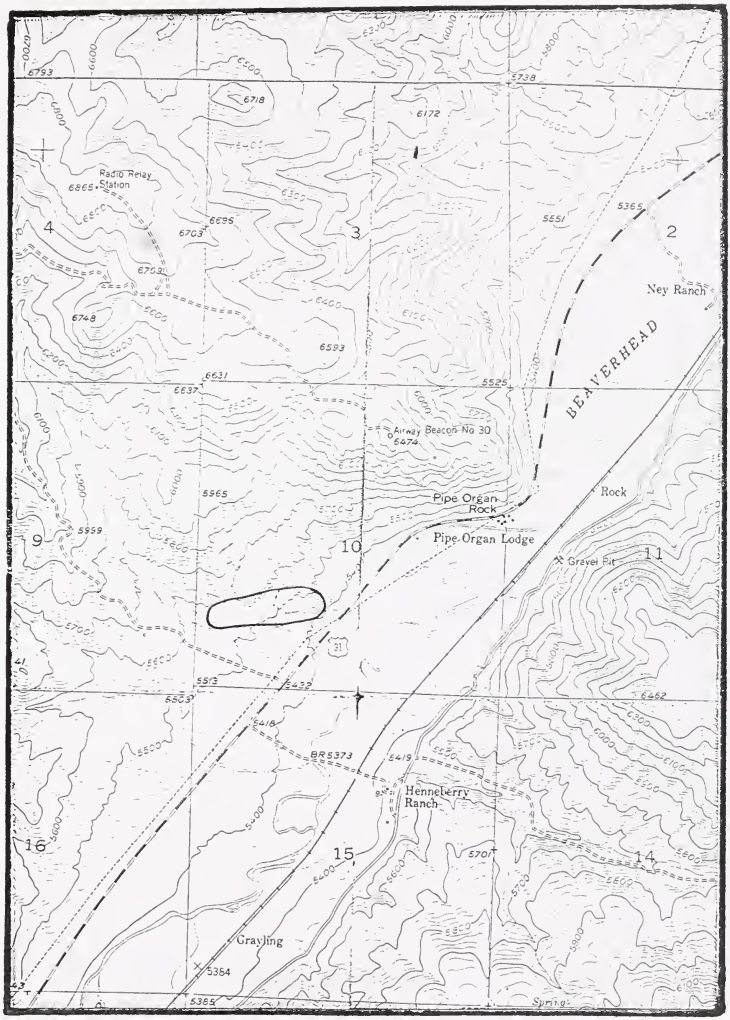
General site description:
DRY, OPEN LOWERSLOPE, FINE SOIL. ASSOCIATED SPECIES: CHRYSOTHAMNUS NAUSEOSUS, ELYMUS SPICATUS, ARTEMISIA TRIDENTATA, OPUNTIA POLYCANTHA, MELILOTUS OFFICINALE, ASTRAGALUS ATROPUBESCENS.

Land owner/manager:
HENNEBERRY FISHING ACCESS SITE

Comments:
SITE HEAVILY GRAZED AND TRAMPLED. MOST INFLORESCENCES BROWSED, SOME PLANTS GRAZED TO GROUND.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5197). 1994. SPECIMEN #119504. MONT.


Radio Relay Station
Airway Beacon No 30
Pipe Organ Rock
Pipe Organ Lodge
Rock
Gravel Pit
Ney Ranch
BEAVERHEAD
Hennelerry Ranch
Grayling
Spring
BR5373
4
3
2
9
10
11
16
15
14

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.015
Element occurrence type:

Survey site name: HENNEBERRY RIDGE
EO rank: CD
EO rank comments: SMALL POPULATION IN DEGRADED HABITAT.

County: BEAVERHEAD

USGS quadrangle: DALYS

Township:	Range:	Section:	TRS comments:
009S	010W	30	NE4

Precision: S
Survey date: 1995-06-17 Elevation: 6100 - 6120
First observation: 1995-06-17 Slope/aspect: 0-5% / -
Last observation: 1995-06-17 Size (acres): 10

Location:
CA. 3 MILES NORTH OF CLARK CANYON. ACCESS FROM HENNEBERRY RIDGE.

Element occurrence data:
OVER 50 PLANTS, ALL IN NON-FLOWERING CONDITION.

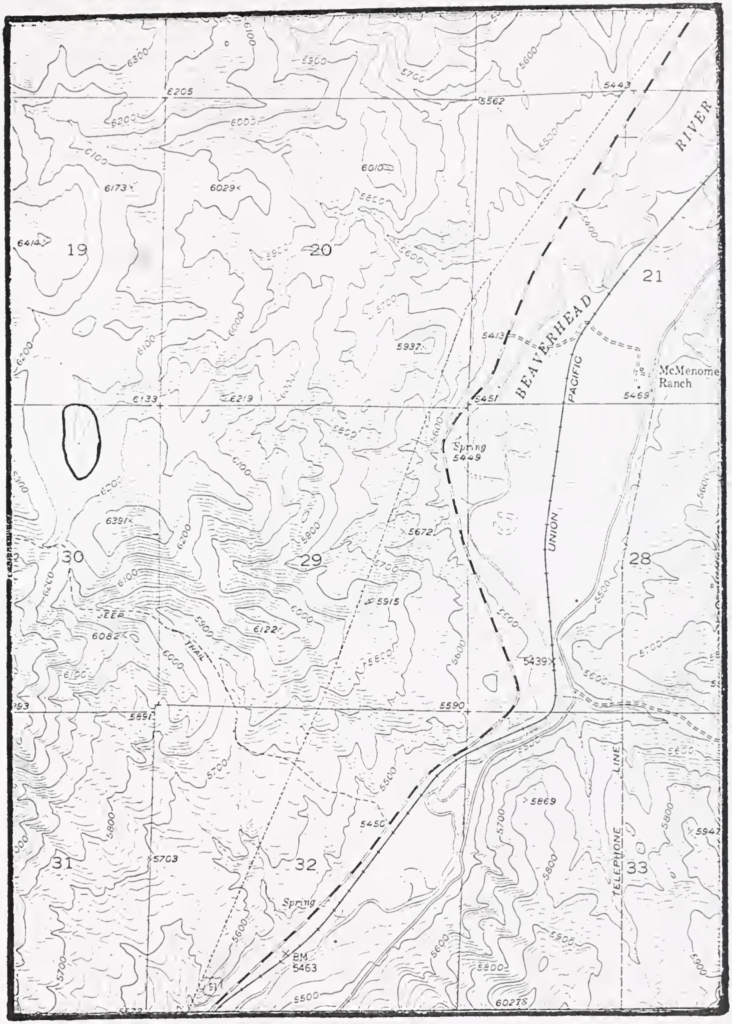
General site description:
MIDSLOPE BASIN SOUTHEAST OF HENNEBERRY RIDGE IN SAGEBRUSH FOOTHILLS ON GENTLE BOTTOMS OVER IGNEOUS BEDROCK. DOMINATED BY ARTEMISIA TRIDENTATA AND AGROPYRON SPICATUM. ASSOCIATED WITH ACHILLEA MILLEFOLIUM, DRABA NEMOROSA, ANTENNARIA MICROPHYLLA, CHRYSOTHAMNUS VISCIDIFLORUS. THE BASIN LIES BELOW AN EMPTY IMPOUNDMENT AND IS GRAZED EARLY IN SEASON.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
EARLY SEASON GRAZING HAS DEGRADED COMPOSITION. THE SITE LIES BELOW AN IMPOUNDMENT.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:



19
20
21
28
29
30
31
32
33
BEAVERHEAD
RIVER
UNION
PACIFIC
TELEPHONE
LINE
McMenome
Ranch
Spring
5449
Spring
JEEP
TRAIL
BM
5463
5443
5562
6205
5413
5451
5469
6133
6219
6173
6029
6010
6414
5937
6391
5672
5915
6122
6082
5439
5590
5691
5869
5947
5703
5450
6027

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.016
Element occurrence type:

Survey site name: COLD SPRING CREEK
EO rank: A
EO rank comments: LARGE POPULATION, INTACT HABITAT.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007S	011W	25	W2; 23 SE4NE4; 24; 25 SW4; 26 SE4; 34 NE4; 35
008S	011W	10	NE4NW4, SE4SW4; 12 NE4

Precision: S
Survey date: 1995-06-13 Elevation: 5840 - 6650
First observation: 1995-06-13 Slope/aspect: 0-20% / -
Last observation: 1995-07-10 Size (acres): 120

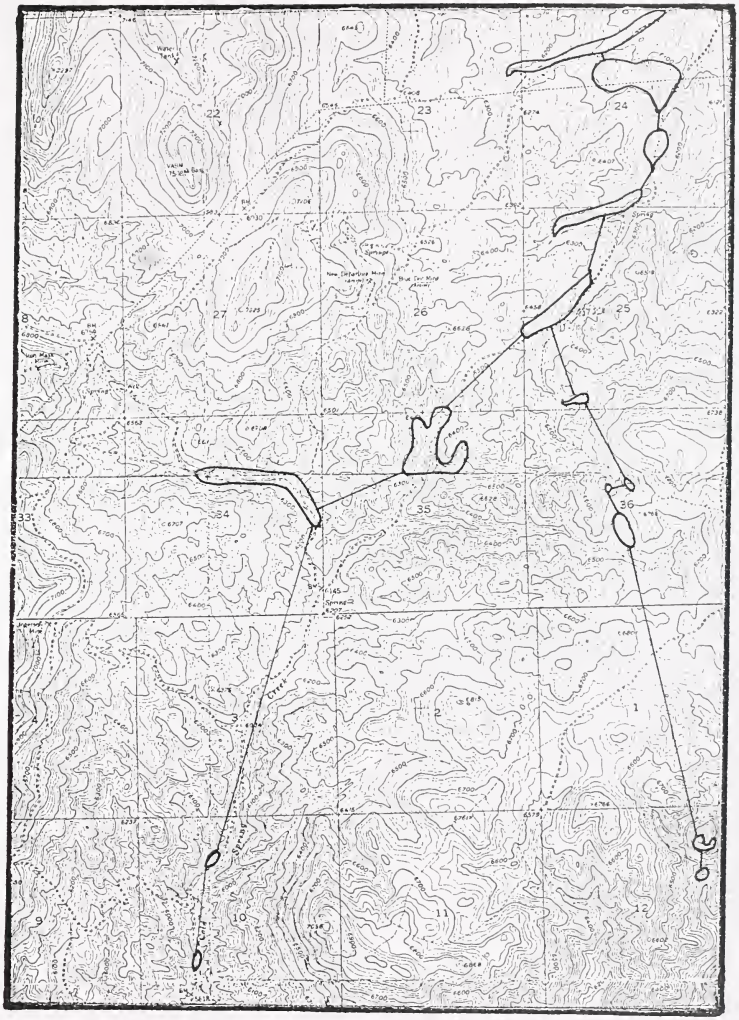
Location:
CA. 12 MILES WEST OF DILLON. TRAVEL CA. 3.5 MILES SOUTH FROM DILLON ON HWY 91 TO BADGER PASS EXIT. GO CA. 6.5 MILES WEST, THEN CA. 3 MILES SOUTHWEST ON FS RD 1801 TO TURN ABOVE MCDOWELL SPRING. POPULATION EXTENDS CA. 5.5 MILES SOUTH ALONG COLD SPRING DRAINAGE.

Element occurrence data:
OVER 10,000 PLANTS, APPROACHING PEAK FLOWERING 13 JUNE 1995. THE POPULATION IS IN SEVERAL SUBPOPULATIONS IN DIFFERENT ELEVATION SEGMENTS OF WATERSHEDS, ALMOST CONTINUOUS BETWEEN WATERSHEDS.

General site description:
WELL-DRAINED STREAM TERRACES AND LESS-XERIC MIDSLOPES IN ROLLING FOOTHILLS, DOMINATED BY ARTEMISIA TRIDENTATA WITH ALTERNATELY FESTUCA IDAHOENSIS OR AGROPYRON SPICATUM. SUBSTRATES ARE WELL-DRAINED ENTISOLS OR LOAMS WITH SAND-SIZE DIABASE PARTICLES. OTHER ASSOCIATED SPECIES INCLUDE: PHLOX LONGIFOLIA, LUPINUS SERICEUS, ASTER SCOPULORUM. HABITAT IN GOOD TO EXCELLENT CONDITION.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
STATE LAND - UNDESIGNATED
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
Comments:
ALLOTMENT USED FOR WINTER GRAZING. LIMITED INVASION OF EXOTICS AND INCREASERS. POPULATION BECOMES VERY SPARSE TOWARDS GRASSHOPPER CREEK WHERE ITS HABITAT IS INTERRUPTED BY SPRINGS AND LIVESTOCK USE INCREASERS. IT MAY BE PART OF POPULATION DOCUMENTED BY LESICA NEARBY ON GRASSHOPPER CREEK.
Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: HEIDEL, B. (1338). 1995. MONT.
VANDERHORST, J. (5437, 5440). 1995. MONT.



MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status: PROPOSED SENSITIVE
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.017
Element occurrence type:

Survey site name: HENNEBERRY RIDGE
EO rank: A
EO rank comments: LARGE POPULATION SPANNING MOST OF POTENTIAL POSITIONS IN LOCAL WATERSHED.

County: BEAVERHEAD

USGS quadrangle: ELI SPRING

Township:	Range:	Section:	TRS comments:
009S	011W	2	N2; 1 NW4
008S	011W	35	S2; 36 N2; 25 S2

Precision: S
Survey date: 1995-06-16 Elevation: 5600 - 6400
First observation: 1995-06-16 Slope/aspect: 0-20% / EAST, NE
Last observation: 1995-06-16 Size (acres): 80

Location:
CA. 7.5 MILES NORTH OF CLARK CANYON RESERVOIR, IMMEDIATELY NORTH OF HENNEBERRY RIDGE, WITH EXTENSIONS DOWN MAJOR GRASSHOPPER CREEK TRIBUTARIES.

Element occurrence data:
OVER 10,000 PLANTS, APPROACHING PEAK FLOWERING 16 JUNE 1995. POPULATION IS CENTERED ON UPPER BENCHLANDS, WITH DISCONTINUOUS STRINGERS DOWN MAJOR TRIBUTARIES OF GRASSHOPPER CREEK AND WITH FLOODPLAIN POPULATION SEGMENTS.

General site description:
GENTLE SEGMENTS OF ROLLING AND CHOPPY SAGEBRUSH FOOTHILLS DRAINING NORTHEAST FROM HENNEBERRY RIDGE INCLUDING BENCHLANDS WITH DIABASE BEDROCK, AND TRIBUTARIES OF GRASSHOPPER CREEK WITH ALLUVIAL SUBSTRATE. DOMINATED BY ARTEMISIA TRIDENTATA AND AGROPYRON SPICATUM. ASSOCIATED WITH PHLOX LONGIFOLIA AND ALLIUM TEXTILE. HABITAT IS IN GOOD TO EXCELLENT CONDITION WHERE SAGEBRUSH STATURE IF SHORT; FAIR CONDITION WHERE SAGEBRUSH IS TALL. NOT PRESENT WHERE SAGEBRUSH LOSES BUSHY GROWTH FORM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
STATE LAND - UNDESIGNATED

Comments:
DISTURBANCE BY LIGHT GRAZING.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:

26
25
35
36
2
1
HENNEBERRY RIDGE

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.002
Element occurrence type:

Survey site name: PIPE ORGAN ROCK
EO rank: B
EO rank comments: LARGE, DENSE POPULATION THREATENED BY WEED INVASION.

County: BEAVERHEAD

USGS quadrangle: DALYS

Township:	Range:	Section:	TRS comments:
009S	010W	03	E2NE4, E2SE4, S2NW4

Precision: S
Survey date: 1994-06-20 Elevation: 5700 -
First observation: 1983 Slope/aspect:
Last observation: 1994-06-20 Size (acres): 10

Location:
CA. 10 MILES SOUTH OF DILLON ON I-15; TAKE FRONTAGE ROAD NEAR GRASSHOPPER CREEK; SITE IS CA. 1 MILE SOUTH OF GRASSHOPPER CREEK.

Element occurrence data:
1994: >1000 PLANTS IN FLOWER. 1983: SMALL POPULATION (LESS THAN 50 PLANTS); MUCH DISTURBANCE BY LIVESTOCK; THERE IS AN OLD ROAD.

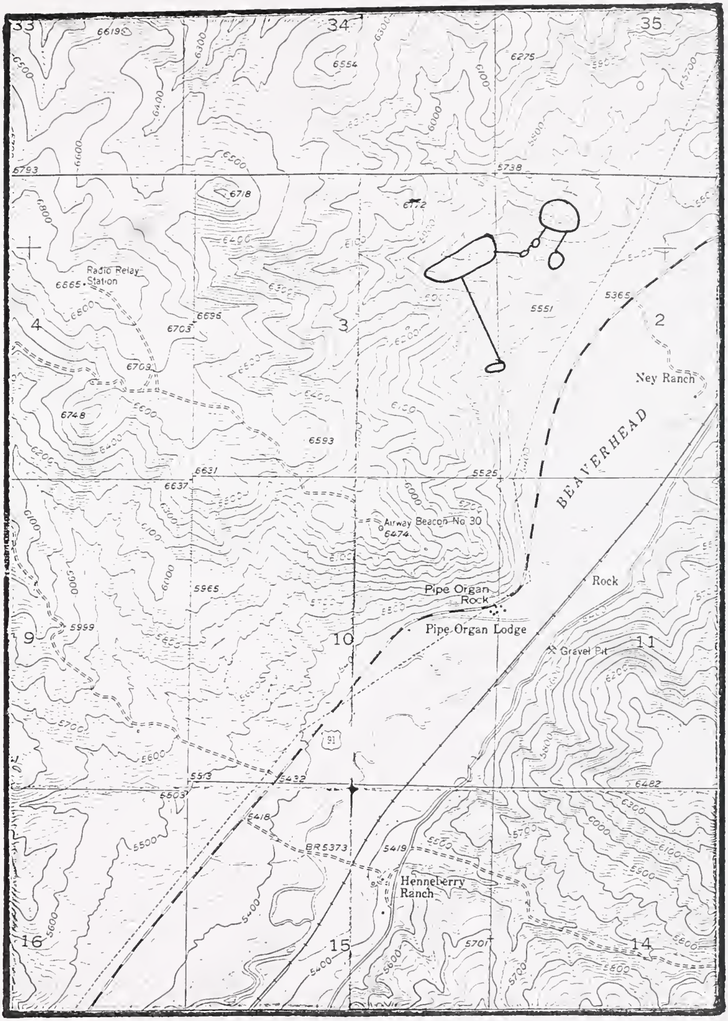
General site description:
SOUTH AND NORTH-FACING SLOPES ABOVE DRY DRAINAGES. STONY TILL SOIL.; SAGEBRUSH-BUNCHGRASS: ARTEMISIA TRIDENTATA/AGROPYRON SPICATUM/ARTEMISIA TRIPARTITA. WITH ELYMUS SPICATUS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
SITE IS IN EXCAVATED AREA AROUND STOCKPOND HEAVILY INFESTED WITH CHEATGRASS, SWEETCLOVER AND HOUNDSTONGUE; BROWSED HEADS OBSERVED. SECTION 3 POPULATION NOT RELOCATED IN 1994 BY VANDERHORST. POSSIBILITY SITE MISMAPPED BY LESICA IN 1983. HABITAT IN NE4 OF SECTION 3 IS WETTER GRASSLAND WITHOUT SAGEBRUSH. LOWER SLOPES INVADED BY MELITOTUS OFFICINALE AND OTHER EXOTICS.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: VANDERHORST, J. (5201). 1994. SPECIMEN #119503. MONT.
LESICA, P. (2701). 1983. SPECIMEN #092921. MONTU.



Radio Relay Station
Ney Ranch
BEAVERHEAD
Rock
Airway Beacon No 30
6474
Pipe Organ Rock
Pipe Organ Lodge
Gravel Pit
Henneberry Ranch
BR 5373
5432
5419
5418
5513
5503
5525
5551
5365
5738
5793
6631
6637
6593
6696
6703
6709
6718
6748
6665
6554
6619
6275
5965
5999
5701
6482
33
34
35
4
3
2
9
10
11
16
15
14

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.004
Element occurrence type:

Survey site name: GRASSHOPPER CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DALYS
ELI SPRING

Township:	Range:	Section:	TRS comments:
008S	010W	30	N2

Precision: M
Survey date:
First observation: 1984
Last observation: 1984-06-12

Elevation: 5600 -
Slope/aspect:
Size (acres):

Location:
NORTH SIDE OF GRASSHOPPER CREEK, CA. 12 MILES SOUTHWEST OF DILLON.

Element occurrence data:
COMMON.

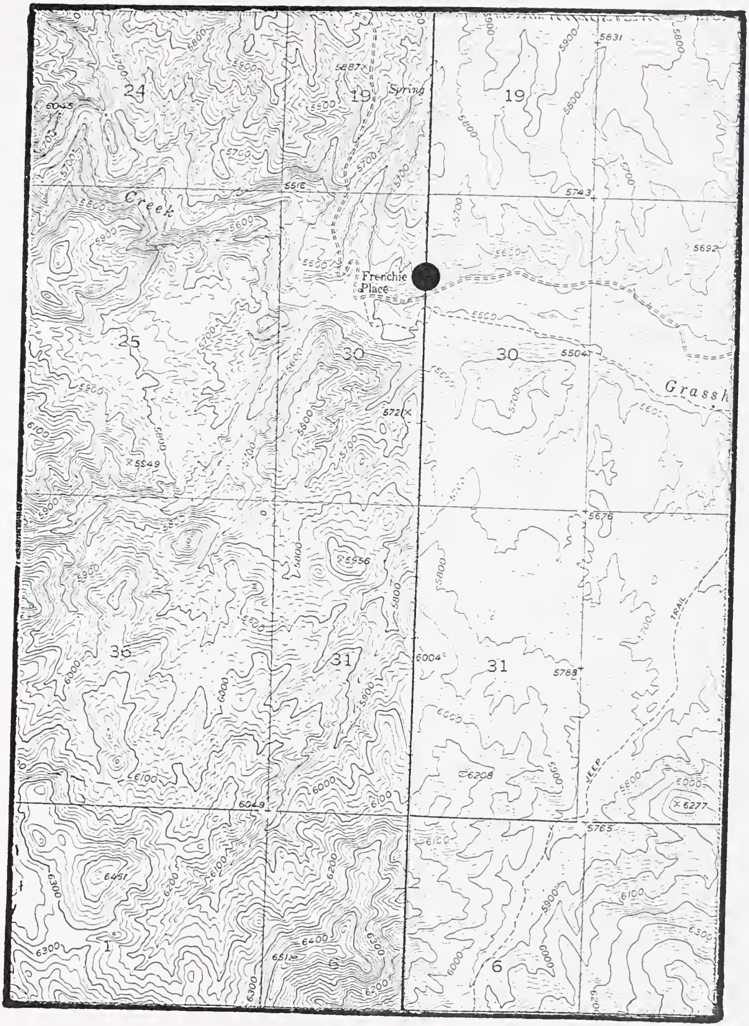
General site description:
IN CALCAREOUS STONEY SOIL ON STEEP SLOPES OF SIDE CANYONS; WITH PHLOX MUSCOIDES AND OXYTROPIS BESSEYI.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
NONE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: LESICA, P. (2996). 1984. SPECIMEN #78288. MONTU.



24
19
Spring
19
5831
5887
6045
5516
Creek
5743
5692
Frenchie
Place
25
30
30
5504
Grassh
5721
5549
5676
5556
36
31
31
6004
5768
6208
6277
6049
5765
6451
6512
1
6
6
JEEP
TRAIL

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.007
Element occurrence type:

Survey site name: MADISON BENCH
EO rank:
EO rank comments:

County: MADISON

USGS quadrangle: GRANITE MOUNTAIN

Township:	Range:	Section:	TRS comments:
010S	001E	06	S2

Precision: S
Survey date: 1990-07-19 Elevation: 5810 -
First observation: 1990 Slope/aspect: 0-30% / LEVEL, WEST
Last observation: 1995-07-26 Size (acres): 20

Location:
FROM CAMERON TAKE HWY 287 SOUTH 14 MILES TO BLM RECREATION AREA. CONTINUE SOUTH 0.25 MILE. SITE IS ON EAST SIDE OF HWY JUST EAST OF FENCE.

Element occurrence data:
1995: 2 NEW SUBPOPULATIONS, 1000-10000 PLANTS, 80% WITH MATURE FRUIT, 20% VEGETATIVE. 1990: 51-100 PLANTS IN MATURE FRUIT; ONLY SMALL AREA SURVEYED, FULL EXTENT OF OCCURRENCE IS UNKNOWN.

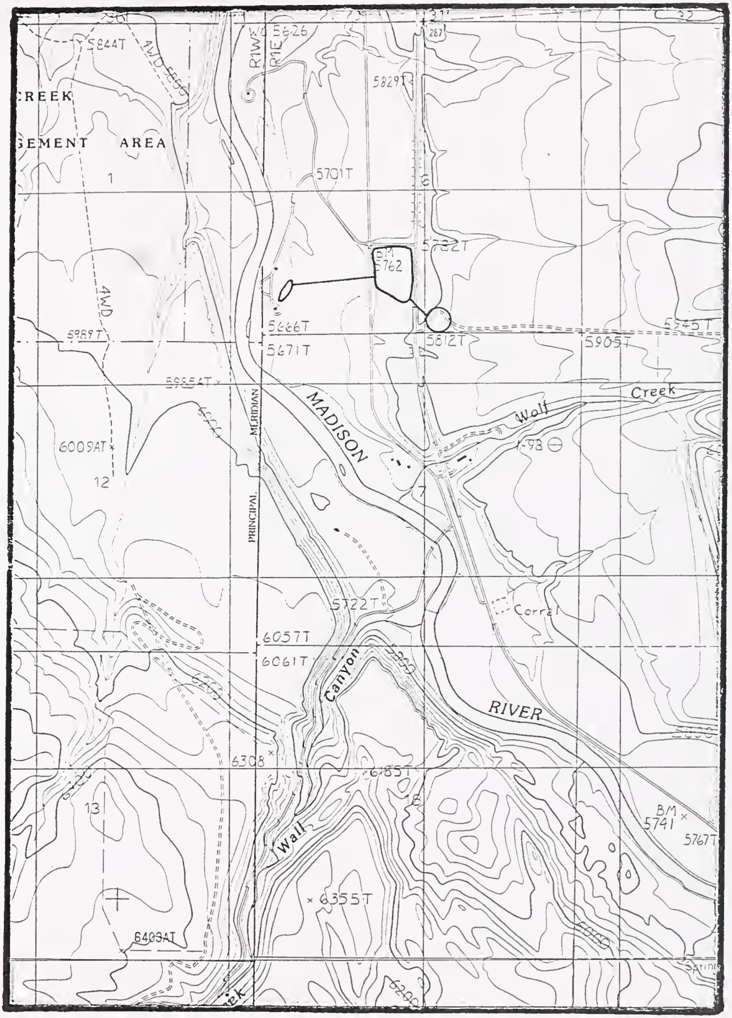
General site description:
DRY, OPEN ALLUVIAL BENCHES. COBBLY ALLUVIUM PARENT MATERIAL, SANDY, ROCKY SOIL. FESTUCA IDAHOENSIS/STIPA COMATA COMMUNITY. ASSOCIATED SPECIES: POA SANDBERGII, ARTEMISIA FRIGIDA, ASTRAGALUS ADSURGENS, STEPHANOMERIA SPINOSA, SELAGINELLA DENSA, ELYMUS SPICATUS, ANTENNARIA MICROPHYLLA, BOUTELOUA GRACILIS, CHRYSOPSIS VILLOSA, CHRYSOTHAMNUS VISCIDUS, KOELERIA MACRANTHA.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
RANGE CONDITION INDICATES LIGHT GRAZING. SITE SURVEY SUMMARY ON FILE AT MTHP. HEAVILY GRAZED AREAS OUTSIDE OF FENCE AND CATTLE GUARDS HAVE NO PLANTS. SUBPOPULATION JUST ABOVE PICNIC AREA IS HEAVILY BROWSED BY GAME. CENTAUREA MACULOSA INVADING POPULATION AREA.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: LESICA, P. (5190). 1990. MONTU.
VANDERHORST, J. (5479). 1995. MONTU.


CREEK
GEMENT AREA
5844T
5626
R1W
R1E
287
31
32
5829T
5701T
BM
5762
5782T
4WD
5989T
5666T
5671T
5812T
5905T
5945T
5985AT
6009AT
MADISON
PRINCIPAL MERIDIAN
Wolf
Creek
12
1
7
13
18
5722T
Corral
6057T
6061T
Canyon
RIVER
6308
6185T
Wall
BM
5741
5767T
6355T
6403AT

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.010
Element occurrence type:

Survey site name: MADISON RIVER
EO rank: A
EO rank comments: LARGE, EXTENSIVE POPULATION.

County: MADISON

USGS quadrangle: BUCKS NEST

Township:	Range:	Section:	TRS comments:
009S	001W	12	NE4SW4; 13 SW4; 24 NW4; 23 NE4

Precision: S
Survey date:
First observation: 1993-05-20
Last observation: 1995-08-31
Elevation: 5560 - 5740
Slope/aspect: 0-60% / EAST
Size (acres):

Location:
CA. 15 MILES SOUTHEAST OF VIRGINIA CITY ALONG MADISON RIVER.

Element occurrence data:
COMMON OVER LARGE AREAS ON BOTH SIDES OF RIVER, REPRESENTING >10,000 PLANTS IN VIGOROUS CONDITION. CA. 50% OF PLANTS IN MATURE FRUIT AND 50% VEGETATIVE IN 1995.

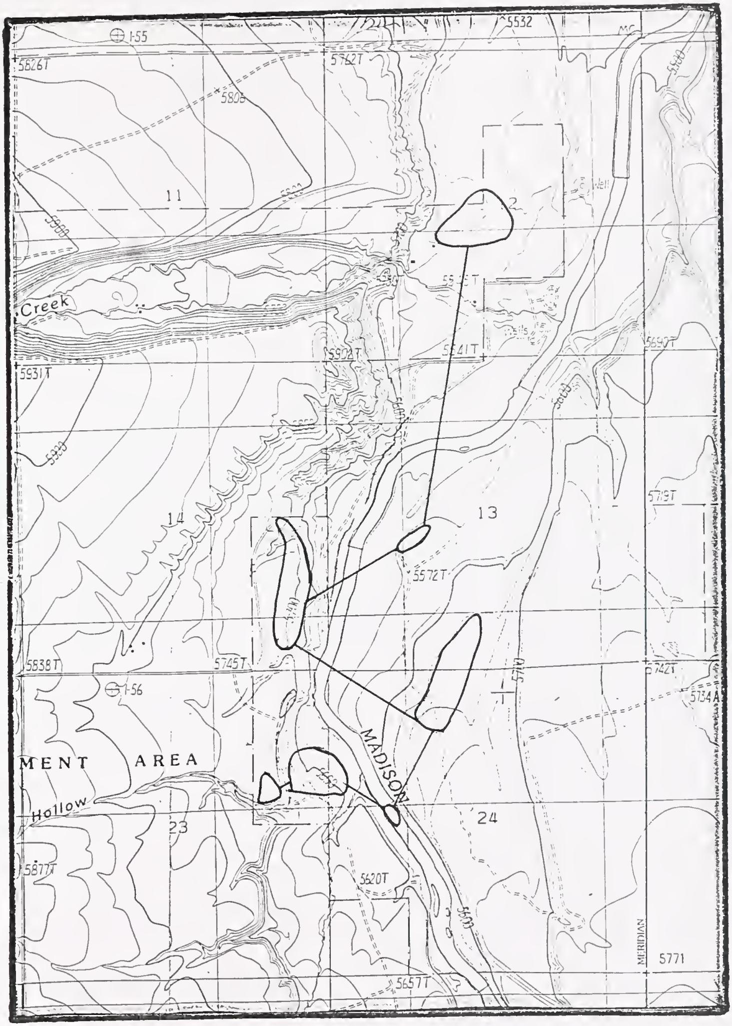
General site description:
OPEN ALLUVIAL BENCHES AND FANS ALONG THE MADISON RIVER VALLEY COVERED BY DRY GRASSLAND DOMINATED BY COMBINATIONS OF AGROPYRON SPICATUM, STIPA COMATA, AND SELAGINELLA DENSA. STIPA COMATA/SELAGINELLA DENSA HABITAT TYPE. OTHER ASSOCIATED SPECIES INCLUDE: ARTEMISIA FRIGIDA, ANTENNARIA MICROPHYLLA, SENECIO CANUS, GRINDELIA SQUARROSA, SPHAERALCEA COCCINEA.

Land owner/manager:
MADISON-WALL CREEK WILDLIFE MANAGEMENT AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
STATE LAND - UNDESIGNATED

Comments:
OBSERVED BY BONNIE HEIDEL ON 31 AUGUST 1995 (SECTIONS 13 AND 24), JIM VANDERHORST ON 25 JULY 1995 (SECTIONS 23 AND 24), AND PETER LESICA IN 1993 (SECTION 12). ADDITIONAL POTENTIAL HABITAT ON STATE LANDS TO THE SOUTH. A FEW CATTLE IN AREA; LIVESTOCK GRAZING REGIME INFORMATION NEEDED.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: VANDERHORST, J. (5470). 1995. MONT.
LESICA, P. (5914). 1993. SPECIMEN #118444. MONTU.



1-55
5532
5826T
5762T
5806
11
2
Creek
5931T
5902T
5541T
5690T
14
13
5719T
5572T
5838T
5745T
5742T
1-56
5734A
MENT AREA
MADISON
Hollow
23
24
5877T
5620T
MERIDIAN
5771
5657T

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.014
Element occurrence type:

Survey site name: MADISON RIVER
EO rank:
EO rank comments:

County: MADISON

USGS quadrangle: BUCKS NEST
CAMERON

Township:	Range:	Section:	TRS comments:
008S	001W	24	NW4

Precision: S
Survey date:
First observation: 1995-07-26
Last observation: 1995-09-01
Elevation: 5400 -
Slope/aspect: LEVEL
Size (acres): 10

Location:
MADISON RIVER CA. 16 MILES SOUTH ON US HWY 287 FROM ENNIS. TAKE DIRT ROAD DOWN TO RIVER; POPULATION IS IN A ROCKY FLOODPLAIN CHANNEL.

Element occurrence data:
1000 TO 10,000 PLANTS, 1 SUBPOPULATION. NEARLY ALL WITH MATURE FRUIT, DISPERSING SEED.

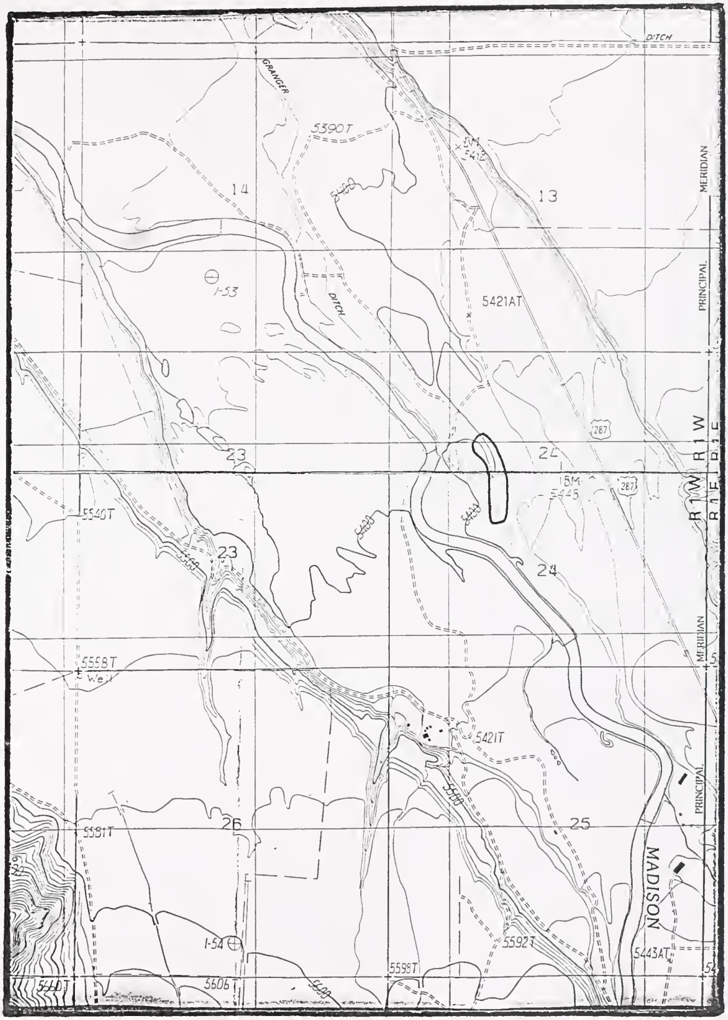
General site description:
OPEN, DRY (SEASONAL MOISTURE) ALLUVIAL FLOODPLAIN BOTTOM. ROCKY, SANDY SOIL, ALLUVIUM PARENT MATERIAL. ASSOCIATED SPECIES: ASTRAGALUS TERMINALIS, STIPA COMATA, POA SP., STEPHANOMERIA SPINOSA, BOUTELOUA GRACILIS, OXYTROPIS SERICEA, ALLIUM CERNUUM, ACHILLEA MILLEFOLIUM, GLYCHORRHIZA LEPIDOTA, LIATRIS PUNCTATA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
OBSERVED BY J. VANDERHORST JULY 1995; REVISITED BY B. HEIDEL SEPTEMBER 1995.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: VANDERHORST, J. (5485). 1995. MONT.


DITCH
GRANGER
5390T
BM
5412
14
13
MERIDIAN
PRINCIPAL
1-53
DITCH
5421AT
5400
287
R1W
R1W
R1E
R1E
23
24
BM
5445
5540T
23
24
MERIDIAN
5558T
Well
5421T
PRINCIPAL
26
25
5591T
MADISON
1-54
5592T
5443AT
5598T
5606T
5600

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ELEOCHARIS ROSTELLATA
Common Name: BEAKED SPIKERUSH

Global rank: G5 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PMCYP091P0.005
Element occurrence type:

Survey site name: WOLF CREEK HOT SPRINGS
EO rank: BC
EO rank comments: NOT VERY EXTENSIVE POPULATION, MUCH OF AREA IS DISTURBED. LIVESTOCK GRAZING.

County: MADISON

USGS quadrangle: SQUAW CREEK

Township:	Range:	Section:	TRS comments:
010S	001E	09	NW4

Precision: S
Survey date: 1990-07-19 Elevation: 6100 -
First observation: 1990 Slope/aspect: 0-3% / LEVEL, WEST
Last observation: 1990-07-19 Size (acres):

Location:
FROM CAMERON, GO SOUTH ON HWY. 287 CA. 14 MILES TO BLM RECREATION AREA. PROCEED SOUTH 0.25 MILE MORE TO GATE IN FENCE ON EAST SIDE OF ROAD. GO THROUGH GATE AND FOLLOW TRAIL TO HOT SPRINGS.

Element occurrence data:
101-1000 PLANTS; STOLON PRODUCTION MAKES IT DIFFICULT TO DISTINGUISH RAMETS AND GENETS.

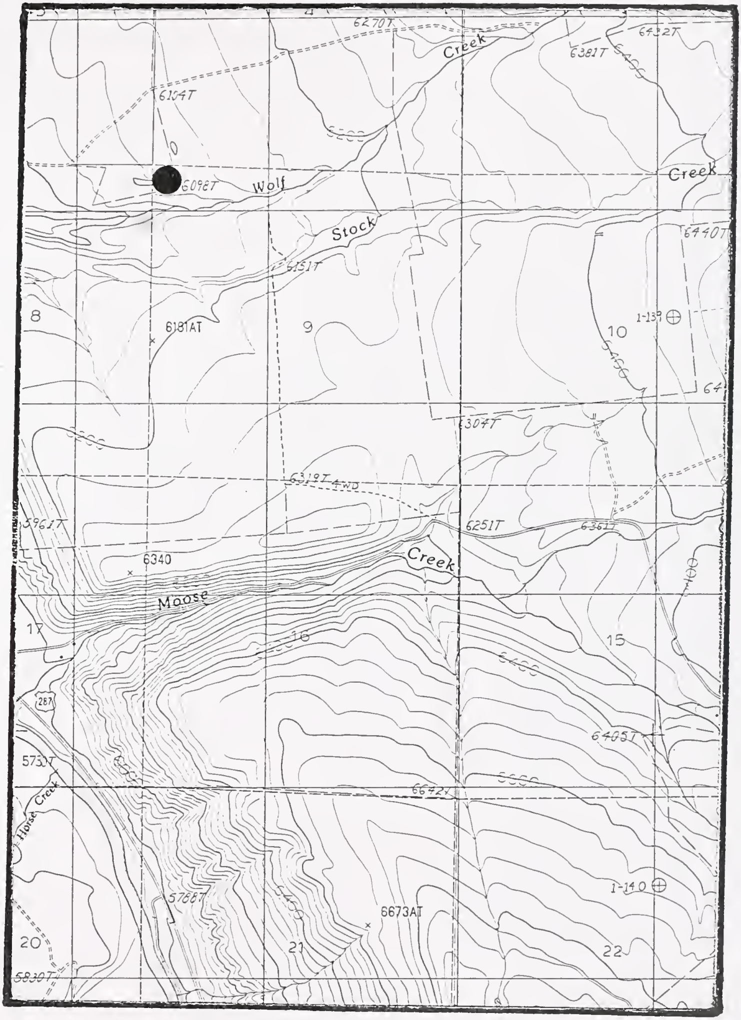
General site description:
HOT AND COLD SPRINGS FLOW INTO MAN-MADE POND, WHICH THEN FLOWS THROUGH A SMALL WET MEADOW. ELEOCHARIS ROSTELLATA/CAREX SIMULATA COMMUNITY. ASSOCIATED SPECIES: CAREX OEDERI, PARNASSIA PARVIFLORA, TRIGLOCHIN MARITIMUM. POND BERM AND AREAS BELOW POND INFESTED WITH EXOTICS.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
FURTHER SPRING DEVELOPMENT COULD DESTROY THE REMAINING NATURAL WETLAND COMMUNITIES.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: LESICA, P. (5187). 1990. MONTU.



6270T
Creek
6432T
6381T
6104T
6098T
Wolf
Creek
Stock
6440T
6151T
8
6181AT
9
10
1-139
6304T
6319T
4WD
5961T
6251T
6361T
6340
Creek
Moose
17
16
15
287
6405T
5730T
Horse Creek
6642T
1-140
5788T
6673AT
20
21
22
5830T

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ERIGERON ASPERUGINEUS
Common Name: IDAHO FLEABANE

Global rank: G4 Forest Service status: SENSITIVE
State rank: S1 Federal Status:

Element occurrence code: PDAST3M0D0.005
Element occurrence type:

Survey site name: ROCHESTER CREEK
EO rank:
EO rank comments:

County: MADISON

USGS quadrangle: NEZ PERCE HOLLOW

Township:	Range:	Section:	TRS comments:
002S	008W	36	SE4

Precision: M
Survey date: Elevation: 6000 -
First observation: 1934-06-12 Slope/aspect: 20% / WEST
Last observation: 1934-06-12 Size (acres):

Location:
ROCHESTER BASIN. WEST OF ROCHESTER.

Element occurrence data:
FLOWERING PERIOD JUNE. ABUNDANCE LIMITED.

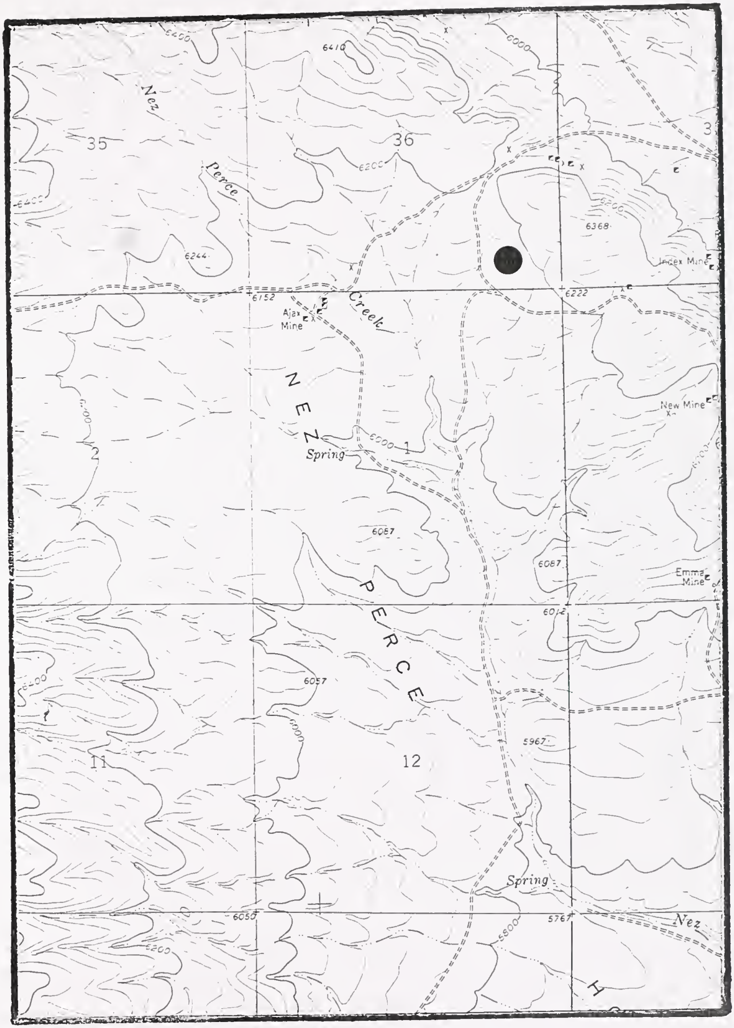
General site description:
GRASS TYPE. SOIL ROCKY GRAVELLY SANDY LOAM.GENERALLY FOUND DRY OPEN SITES WITH GR-YB-ST. USE: OVERGRAZING.

Land owner/manager:
STATE LAND - UNDESIGNATED

Comments:

Information source: BOTANIST, MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, HELENA, MT 59620-1800.

Specimens: BENSON, F. (B215). 1934. MRC.



6400
6410
6000
Nez
Perce
35
36
3
6200
6400
6244
6368
Index Mine
6152
Creek
Ajax Mine
6222
NEZ
New Mine
6000
Spring
1
2
6057
6087
Emma Mine
PERCE
6012
6400
6057
6000
5967
11
12
Spring
6050
5767
Nez
6200
5800
H

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ERIGERON LINEARIS
Common Name: LINEARLEAF FLEABANE

Global rank: G5 Forest Service status: SENSITIVE
State rank: S1 Federal Status:

Element occurrence code: PDAST3M2B0.003
Element occurrence type:

Survey site name: ERMONT GULCH
EO rank: D
EO rank comments: ACCIDENTAL? SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: ARGENTA

Township:	Range:	Section:	TRS comments:
007S	010W	6	SE4

Precision: S
Survey date: 1995-06-14 Elevation: 6020 -
First observation: 1995-06-14 Slope/aspect: 5% / NE
Last observation: 1995-06-14 Size (acres): 1

Location:
CA. 10 MILES WEST OF DILLON. FROM DILLON, TAKE HWY 91 SOUTHWEST CA. 3.5 MILES TO BADGER PASS EXIT. GO WEST CA. 6.5 MILES TO ERMONT GULCH ROAD. TAKE THIS ROAD CA. 3 MILES NORTHWEST. POPULATION IS NORTH OF ROAD.

Element occurrence data:
OVER 50 MULTISTEMMED PLANTS, IN FLOWER 14 JUNE 1995. RESTRICTION OF POPULATION TO SMALL AREA REMOVED OF ARTEMISIA TRIDENTATA INDICATES IT MAY BE ACCIDENTAL.

General site description:
ROLLING SAGEBRUSH FOOTHILLS ON ERMONT GULCH, LOCALLY DOMINATED BY AGROPYRON SPICATUM, ON DRY GENTLE SLOPE OVER DIABASE. ASSOCIATED SPECIES: HAPLOPAPPUS ACAULIS, ARENARIA KINGII, OXYTROPIS SERICEA, CHRYSOTHAMNUS VISCIDIFLORUS.

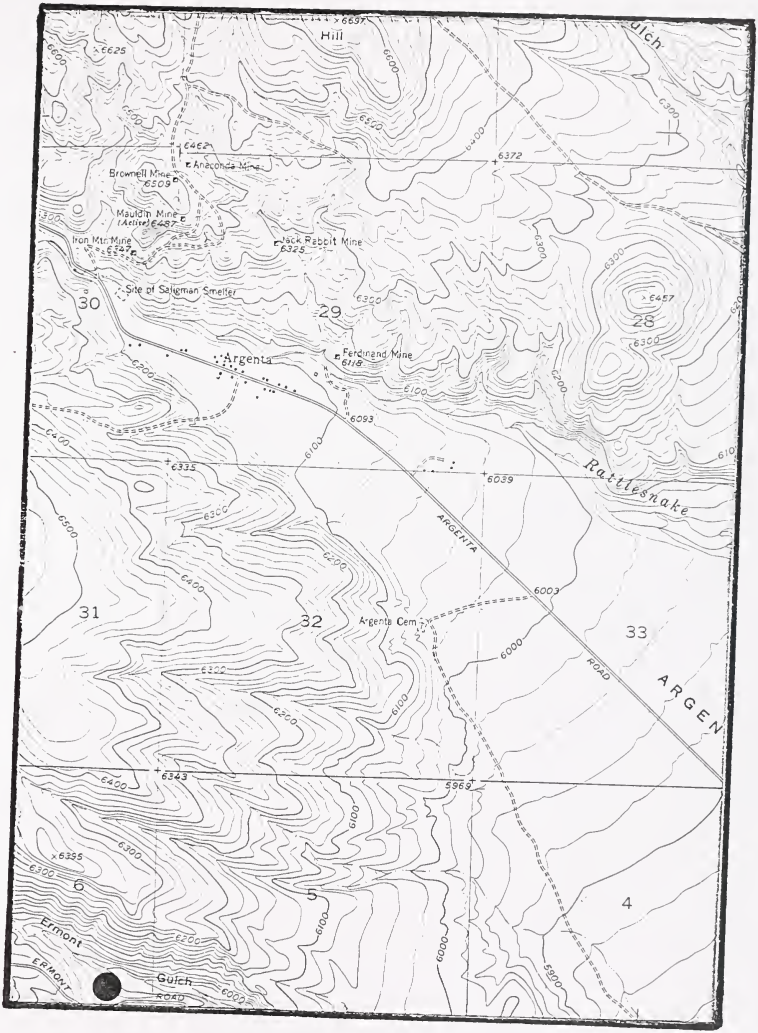
Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
DISTURBANCE BY OLD MINING OPERATION.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1343). 1995. MONTU.

6



Hill
Anaconda Mine
Brownell Mine
Mauldin Mine
(Active)
Iron Mtn Mine
Jack Rabbit Mine
Site of Saligman Smelter
Argenta
Ferdinand Mine
Rattlesnake
ARGENTA
Argenta Cem
ROAD
ARGEN
Ermont
ERMONT
Gulch
ROAD
30
29
28
31
32
33
6
5
4

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: KOCHIA AMERICANA
Common Name: RED SAGE

Global rank: G5 Forest Service status:
State rank: SU Federal Status:

Element occurrence code: PDCHE0E010.003
Element occurrence type:

Survey site name: BROWNE'S GULCH
EO rank: A
EO rank comments: PLANT SHOWS LIMITED RESPONSE TO GRAZING DEGRADATION.

County: BEAVERHEAD

USGS quadrangle: EARLS GULCH

Township:	Range:	Section:	TRS comments:
003S	009W	27	N2; 28 E2; 22 S2

Precision: S
Survey date: 1995-06-15 Elevation: 5160 - 5280
First observation: 1995-06-15 Slope/aspect: 0-10% / ALL
Last observation: 1995-08-17 Size (acres):

Location:
FROM GLEN/ROCK CREEK, EXIT ON US HWY 91. GO NORTH 2 MILES ON ROAD THAT FOLLOWS THE VALLEY EDGE, ACCESSIBLE VIA BOTH BLM ROADS THAT LEAD NORTHWEST.

Element occurrence data:
COMMON AND LOCALLY CODOMINANT WITH DISTICHILIS STRICTA UNDER ARTEMISIA TRIDENTATA - SARCOBATUS VERMICULATUM OF ALKALINE FLATS. LESS COMMON IN CLAYPAN PATCHES, LOCALIZED WASHES AND ADJOINING HILLS ASSOCIATED WITH SAME SHRUBS AND WITH BOUTELOUA GRACILIS, AGROPYRON SPICATUM. EARLIEST BUDS FORMED 15 JUNE 1995; MATURE FRUITS FORMED 15 AUGUST 1995.

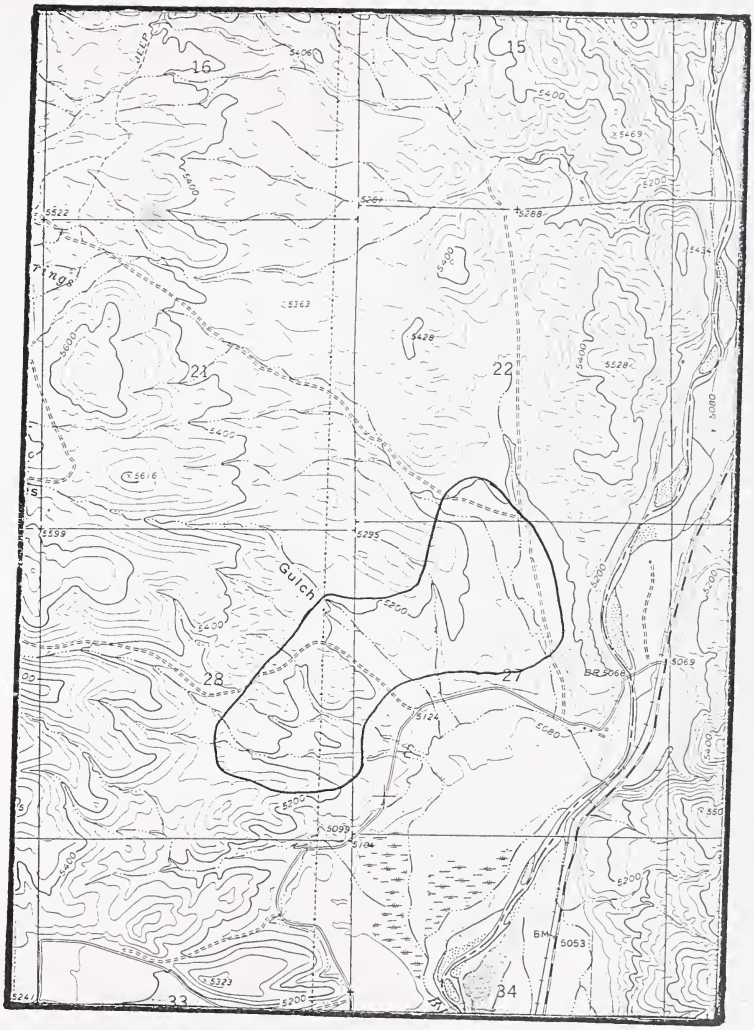
General site description:
OPEN, STRAIGHT, ALKALINE FLATS AND WASHES IN ONE SEGMENT OF BIG HOLE VALLEY BOTTOM, LOWERSLOPE MARGIN MADE UP OF SANDY ALLUVIUM; CODOMINANT WITH DISTICHILIS STRICTA UNDER ARTEMISIA TRIDENTATA - SARCOBATUS VERMICULATUM. ALSO IN CLAYPAN PATCHES, LOCALIZED WASHES, AND ADJOINING HILLS ASSOCIATED WITH SOME SHRUBS AND WITH BOUTELOUA GRACILIS, AGROPYRON SPICATUM. ADDITIONAL ASSOCIATED SPECIES: OPUNTIA POLYACANTHA, SITANION HYSTRIX, LAPPULA REDOWSKII, ATRIPLEX NUTTALLII, DESCURAINIA RICHARDSONII.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
SURVEYED BY B. HEIDEL. SECTION 28 HEAVILY GRAZED BY CATTLE; AREA HAS LONG HISTORY OF MODERATE TO HEAVY GRAZING AS EVIDENCED BY ABUNDANT INCREASER SPECIES AND GULLIED WATER COURSES. POPULATION BOUNDARY ROUGHLY ESTIMATED BECAUSE PLANTS EXTEND OUTSIDE OF BLM BOUNDARIES.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1355). 1995. MONTU, MONT.


16
15
21
22
28
27
33
34
Gulch
BM 5053
BR 5066

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S2 Federal Status: 3C

Element occurrence code: PDAPI1B240.003
Element occurrence type:

Survey site name: BANNACK
EO rank: A
EO rank comments: EXTENSIVE MINING AND GRAZING IN AREA BUT LIMITED ON THESE RIDGES.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	5	ALL; 4 W4

Precision: S
Survey date: 1994-06-12 Elevation: 5780 - 7100
First observation: 1994-06-12 Slope/aspect: 0-30% / WNW, ESE, SOUTH, WEST
Last observation: 1995-06-14 Size (acres): 160

Location:
RIDGES NORTHEAST OF BANNACK, OVERLOOKING TOWNSITE.

Element occurrence data:
1995: OVER 10,000 PLANTS WITH EXPANSION OF EO BOUNDARIES ON ESE ASPECT AND LARGER ADJOINING RIDGE SYSTEM. OCCASIONAL TO LOCALLY COMMON ACROSS A WIDE ARRAY OF RIDGE SETINGS ON LIMESTONE, WITH WAIF DISPERSALS IN STREAMCOURSES AND IN THE TOWNSITE. 1994: 1000-10,000 PLANTS, 50% VEGETATIVE, 50% IN FRUIT, 1% IN FLOWER.

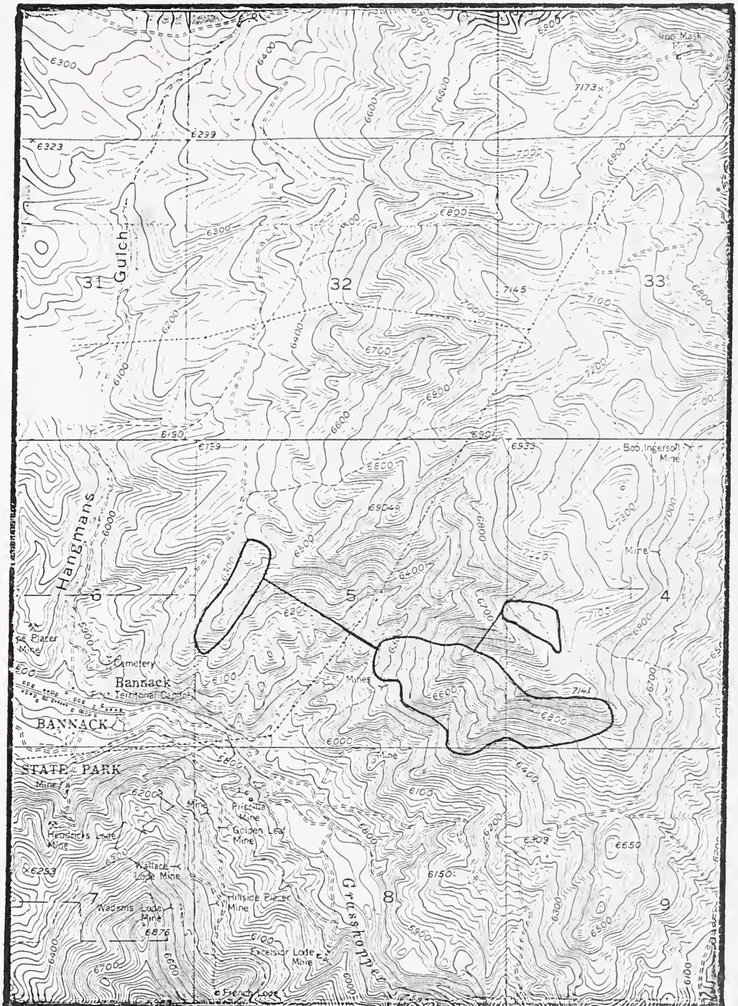
General site description:
MAINLY DRY, OPEN RESIDUAL UPPERSLOPE AND RIDGE CREST. LIMESTONE PARENT MATERIAL, GRAVELLY CLAY SOIL. ASSOCIATED SPECIES: ELYMUS SPICATUS, CERCOCARPUS LEDIFOLIUS, PINUS FLEXILUS, ARTEMISIA FRIGIDA, LITHOSPERMUM INCISUM, DELPHINIUM BICOLOR, LESQUERELLA SP., CRYPTANTHA CELOSIOIDES, ALLIUM TEXTILE, PETROPHYTON CAESPITOSUM, SPHAEROMERIA ARGENTEA, TOWNSENDIA SPATHULATA, PHACELIA INCANA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
BANNACK STATE PARK IS APPLYING FOR A "R & PP" WITHDRAWAL WHICH INCLUDES THIS SITE, WHICH WOULD ELIMINATE THREATS OF FUTURE MINING AND POTENTIAL GRAZING. 5 SPECIES OF CONCERN OCCUR IN AREA. OBSERVED IN 1995 BY B. HEIDEL.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: VANDERHORST, J. (5191). 1994. MONT.



Iron Mask Mine
31
Gulch
32
33
Bob Ingersoll Mine
Hangmans
6
5
4
Cemetery
Bannack
Territorial Capitol
BANNACK
STATE PARK
Mines
Priscilla Mine
Golden Leaf Mine
Hendricks Lode Mine
Wallace Lode Mine
Hillside Placer Mine
Excelsior Lode Mine
French Lode
7
8
9
Grasshopper

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S2 Federal Status: 3C

Element occurrence code: PDAPI1B240.006
Element occurrence type:

Survey site name: ROCKY HILLS
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: GRANT

Township:	Range:	Section:	TRS comments:
008S	011W	30	NW4; 19 SW4; 31 NW4

Precision: S
Survey date:
First observation: 1995-07-22
Last observation: 1995-07-22

Elevation: 6800 - 7587
Slope/aspect: 1-15% / SOUTH, SW
Size (acres):

Location:
CA. 2.5 MILES DUE SOUTH OF BANNACK; GOING CA. 3 MILES SOUTH OF BANNACK HWY ON WEST ROAD, CA. 3 MILES EAST ON BLM ROAD 1827, AND CA. 0.5 MILE ON 2-TRACK (LEFT FORK) TO RIDGE. POPULATIONS LIE 0.2 MILE NORTH, 0.5 MILE NORTH, AND 1 MILE SOUTH.

Element occurrence data:
3 SUBPOPULATIONS. 3 PLANTS IN SECTION 31, CA. 5 IN SECTION 30, AND CA. 50 IN SECTION 19.

General site description:
OPEN, DRY UPPERSLOPE. CALCAREOUS SILT WITH MUCH COBBLE. MADISON GROUP PARENT MATERIAL. ASSOCIATED SPECIES: AGROPYRON SPICATUM (SPARSE PHASE), SPAHEROMERIA ARGENTEA (NORTHERN 2 POPULATIONS), HAPLOPAPPUS ACAULIS, PENSTEMON ARIDUS, POA SCABRELLA, TOWNSENDIA NUTTALLII, ALLIUM TEXTILE, LINUM LEWISII, LESQUERELLA PULCHELLA (SOUTHERN SUBPOPULATIONS).

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SURVEYED BY B. HEIDEL. LITTLE MINING ACTIVITY, NO SIGNS OF GRAZING. LIKELY TO BE MORE SUBPOPULATIONS IN AREA.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:


23
24
R 12 W
R 11 W
19
6523
6616
6526
26
25
6804
30
6391
7037
4WD
35
36
31
ROCKY
HILLS
6958
T 8 S
T 9 S
2
1
6

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S2 Federal Status: 3C

Element occurrence code: PDAPI1B240.007
Element occurrence type:

Survey site name: ROAD AGENTS ROCK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007S	011W	28	SW4; 29 SE4

Precision: S
Survey date:
First observation: 1995-07-09
Last observation: 1995-07-09

Elevation: 6780 - 7173
Slope/aspect: 10-30% / NORTH, WEST
Size (acres): 40

Location:
CA. 3 AIR MILES NNW OF BANNACK ON HILLS TO SOUTH OF ROAD AGENTS ROCK. ACCESS VIA BON ACCORD ROAD FROM HWY 278.

Element occurrence data:
500-1000 PLANTS, 4 SUBPOPULATIONS. MATURE FRUIT.

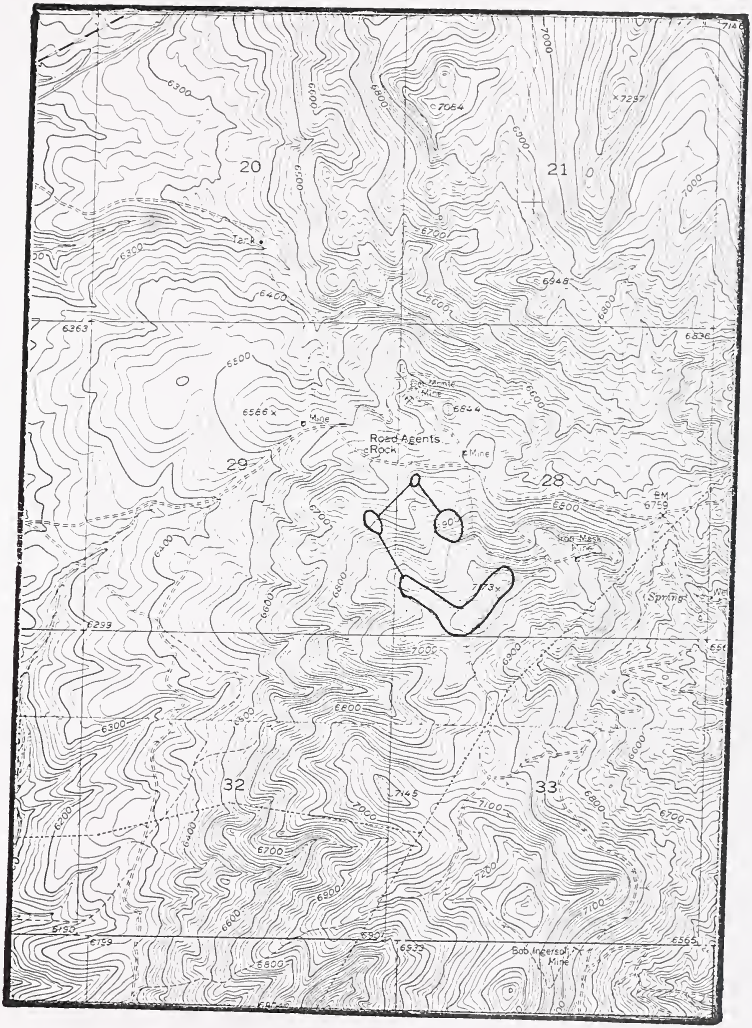
General site description:
MOSTLY ON GRAVELLY ROCK OUTCROPS. OPEN, DRY CREST UPPERSLOPE, MIDSLOPE. LIMESTONE PARENT MATERIAL, SEDIMENTARY UPLANDS. LOW SAGEBRUSH, DOUGLAS FIR FOREST. WITH ARTEMISIA ARBUSCULA, PSEUDOTSUGA MENZIESII, IVESIA GORDONII, ERIGERON CAMPOSITUS, ALLIUM TEXTILE, HAPLOPAPPUS ACAULIS, ERIGERON TWEEDYI, DELPHINIUM BICOLOR SSP. NOVUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
OBSERVED BY J. VANDERHORST.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5436). 1995. MONT.



20
21
28
29
32
33
Tank
Mine
Road Agents Rock
Iron Mask Mine
Spring
BM 6759
Bob Ingersol Mine
7084
7297
6948
6363
6836
6586
6644
6299
7145
6565
6933
6190
6199
6300
6400
6500
6600
6700
6800
6900
7000
7100
7200

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S2 Federal Status: 3C

Element occurrence code: PDAPI1B240.008
Element occurrence type:

Survey site name: COLD SPRING CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007N	011W	36	CENTER; 35 NW4NE4

Precision: S
Survey date:
First observation: 1995-07-10
Last observation: 1995-07-10

Elevation: 6320 - 6600
Slope/aspect: 10-30% / SW
Size (acres): 1

Location:
FROM TENMILE HOUSE ON HWY 278, TAKE BON ACCORD ROAD WEST CA. 3 MILES TO FORK. TURN LEFT AND FOLLOW CA. 1.5 MILES TO SECOND FORK. TAKE ANOTHER LEFT, AND FOLLOW ROAD CA. 1.5 MILES. POPULATION IS ON WEST-FACING SLOPE TO SOUTH OF ROAD.

Element occurrence data:
10 PLANTS COUNTED, 1 SUBPOPULATION. 100% WITH MATURE FRUIT.

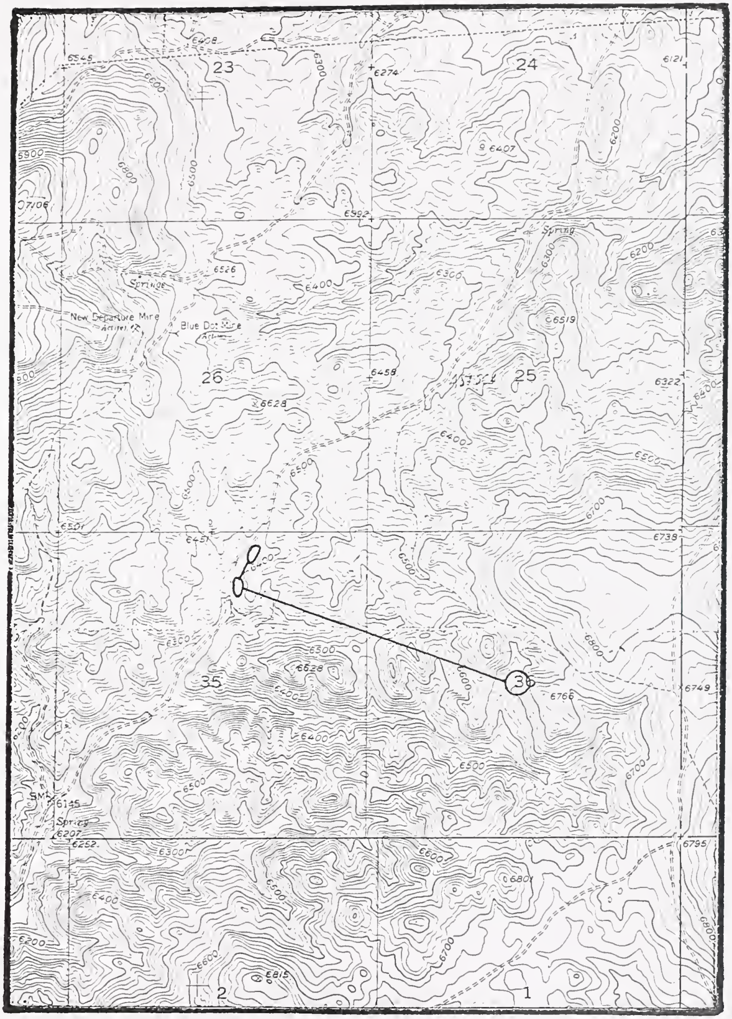
General site description:
OPEN, DRY LOWER TO MID ROCK OUTCROP SLOPE. ROCKY, SANDY GRAVEL. BASALT (?) PARENT MATERIAL. ASSOCIATED SPECIES: ELYMUS SPICATUS, ARTEMISIA TRIDENTATA, ERIGERON CAESPITOSUS, DELPHINIUM BICOLOR, PENSTEMON ARIDUS.

Land owner/manager:
STATE LAND - UNDESIGNATED
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
OBSERVED BY J. VANDERHORST ON 10 JULY 1995 AND ON 22 JULY 1995 BY B. HEIDEL.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5441). 1995. MONT.


23
24
26
25
35
2
1
New Departure Mine
Blue Dot Mine
Springs
Spring
6545
6408
6274
6121
6407
7106
6592
6526
6519
6458
6628
6322
6501
6451
6738
6749
6766
6145
6207
6252
6795
6801
6815

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS
Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.005
Element occurrence type:

Survey site name: BADGER PASS
EO rank: B
EO rank comments: LARGE POPULATION, MOSTLY NATIVE HABITAT, FENCE EXCLOSURE.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007S	011W	22	N2NW4

Precision: S
Survey date: 1986-06-20 Elevation: 7260 -
First observation: 1972-06-27 Slope/aspect: 35% / SW, E-NE
Last observation: 1989-06-14 Size (acres): 10

Location:
1.45 AIR MILES SSE. OF BADGER PASS, ADJACENT TO MICROWAVE TOWER ON GRAVEL ROAD 1.3 AIR MI. S. OF BIG HOLE ROAD (ST. HWY. 278), CA. 4.5 AIR MI. NNE. OF BANNACK.

Element occurrence data:
1989: VERY FEW PLANTS OBSERVED, AND NONE FOUND INSIDE EXCLOSURE. 1986: 190 PLANTS COUNTED; CA. 75 PLANTS ARE WITHIN A FENCE EXCLOSURE WHICH WAS CONSTRUCTED TO PROTECT PART OF THE POPULATION. 1972: SCARCE.

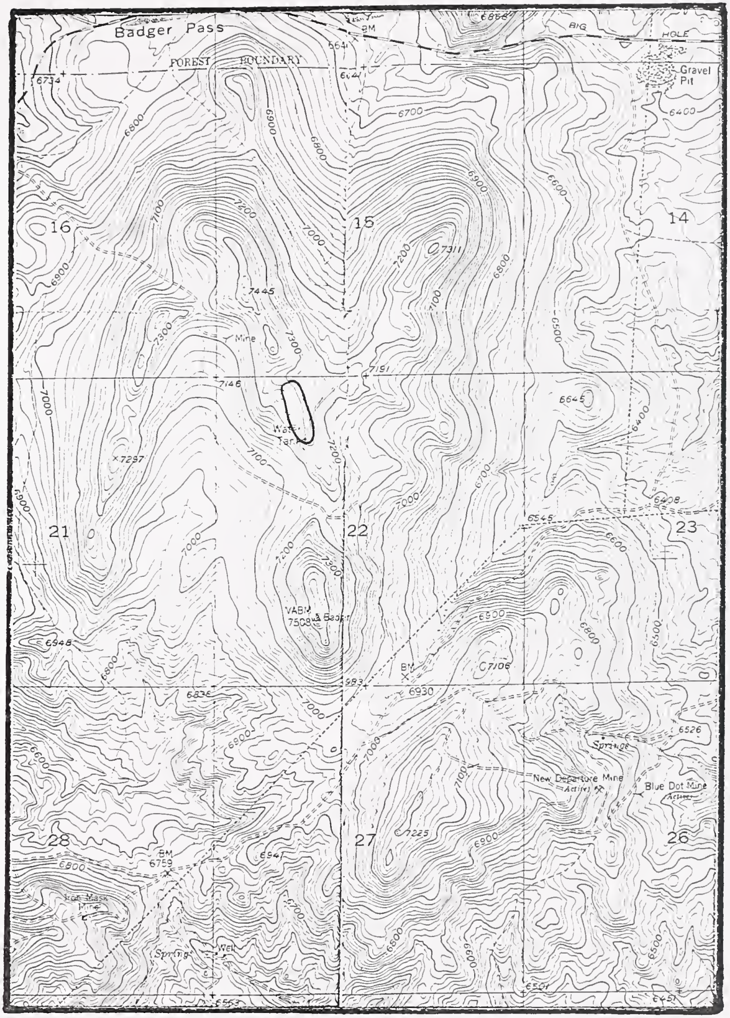
General site description:
GRAVELLY LOAM SOILS, MIDSLOPE; ARTEMISIA TRIDENTATA/ PSEUDOTSUGA MENZIESII/FESTUCA IDAHOENSIS/AGROPYRON SPICATUM, LUPINUS LEUCOPHYLLUS, ANTENNARIA MICROPHYLLA, GEUM, SEDUM, PINUS FLEXILIS, SELAGINELLA DENSA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: SHELLY, J. S. 1986. [FIELD SURVEYS IN BEAVERHEAD COUNTY OF 18-22 JUNE.]

Specimens: SHELLY, J. S. (1147) AND G.V. KING. 1986. MONTU.
KOVALCHICK, B. L. (199). 1972. MRC.



Badger Pass
FOREST BOUNDARY
BM
6734
6641
6868
BIG HOLE
Gravel Pit
6400
6700
6800
6900
7000
7100
7200
7300
16
15
14
7311
7445
Mine
7146
7191
6645
Water Tank
7297
21
22
23
6545
6408
6600
6500
VABM 7508
6948
6836
BM
6930
7106
6526
Spring
New Departure Mine
Blue Dot Mine
28
27
26
7225
BM 6759
6947
Iron Mask Mine
Spring
Well
6553
6501
6451

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS
Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.014
Element occurrence type:

Survey site name: ERMONT GULCH
EO rank: C
EO rank comments: SMALL POPULATION, NATIVE HABITAT IMPACTED BY GRAZING.

County: BEAVERHEAD

USGS quadrangle: ERMONT

Township:	Range:	Section:	TRS comments:
006S	011W	33	NE4SE4; 34 W2

Precision: S
Survey date: 1986-06-20 Elevation: 6740 -
First observation: 1986 Slope/aspect:
Last observation: 1989-07-27 Size (acres): 5

Location:
CA 4.3 AIR MI. WSW. OF ARGENTA, ALONG BEAVERHEAD N.F. RD. #7467 AT HEAD OF ERMONT GULCH, CA. 2.2 AIR MI. N. OF BADGER PASS, PIONEER MOUNTAINS.

Element occurrence data:
76 PLANTS COUNTED (1986); ONLY ONE PLANT SEEN IN 1989; AREA SUBJECT TO MODERATE TO HEAVY GRAZING.

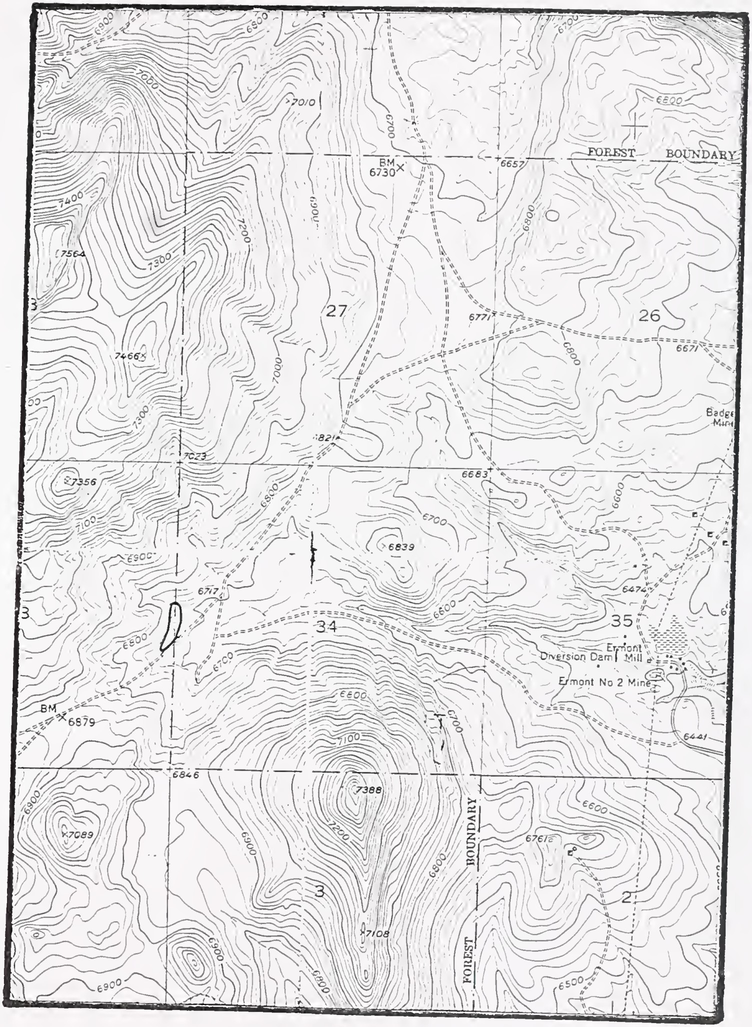
General site description:
SE-FACING SLOPE, LOAM SOILS; ARTEMISIA TRIDENTATA/FESTUCA IDAHOENSIS, ANTENNARIA MICROPHYLLA, KOELERIA MACRANTHA, COMANDRA UMBELLATA, ERIOGONUM.

Land owner/manager:
BEAVERHEAD NATIONAL FOREST, DILLON RANGER DISTRICT
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: SHELLY, J. S. 1986. [FIELD SURVEYS IN BEAVERHEAD COUNTY OF 18-22 JUNE.]

Specimens: SHELLY, J. S. (1146) AND G. V. KING. 1986. MONTU.


FOREST BOUNDARY
BM 6730
6657
27
26
6771
6671
Badger Mine
7564
7466
7356
7023
6683
6839
6717
6474
34
35
Ermont Mill
Diversion Dam
Ermont No 2 Mine
BM 6879
6441
6846
7388
7089
6761
3
2
7108
FOREST BOUNDARY

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS
Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.019
Element occurrence type:

Survey site name: BADGER PASS NORTH
EO rank: B
EO rank comments: MODERATE-SIZED POPULATION; FAIR TO GOOD CONDITION RANGELAND.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007S	011W	09	NE4NE4; 10 NW4; 3 SW4

Precision: S
Survey date: 1987-06-18 Elevation: 6980 -
First observation: 1987 Slope/aspect:
Last observation: 1989-07-28 Size (acres): 4

Location:
SOUTHERN PIONEER MOUNTAINS, 0.7-1.2 AIR MILES NNE. OF BADGER PASS; ABOUT 15 AIR MILES WEST OF DILLON.

Element occurrence data:
ABOUT 200 PLANTS COUNTED, POPULATION = EST. 300+ PLANTS, 3 SUBPOPULATIONS OBSERVED; FLOWERING; NUMEROUS PLANTS GROWING THROUGH BRANCHES OF SAGEBRUSH SHRUBS; AREA IS LIGHTLY TO MODERATELY GRAZED; PERMANENT MONITORING TRANSECT ESTABLISHED IN 1989.

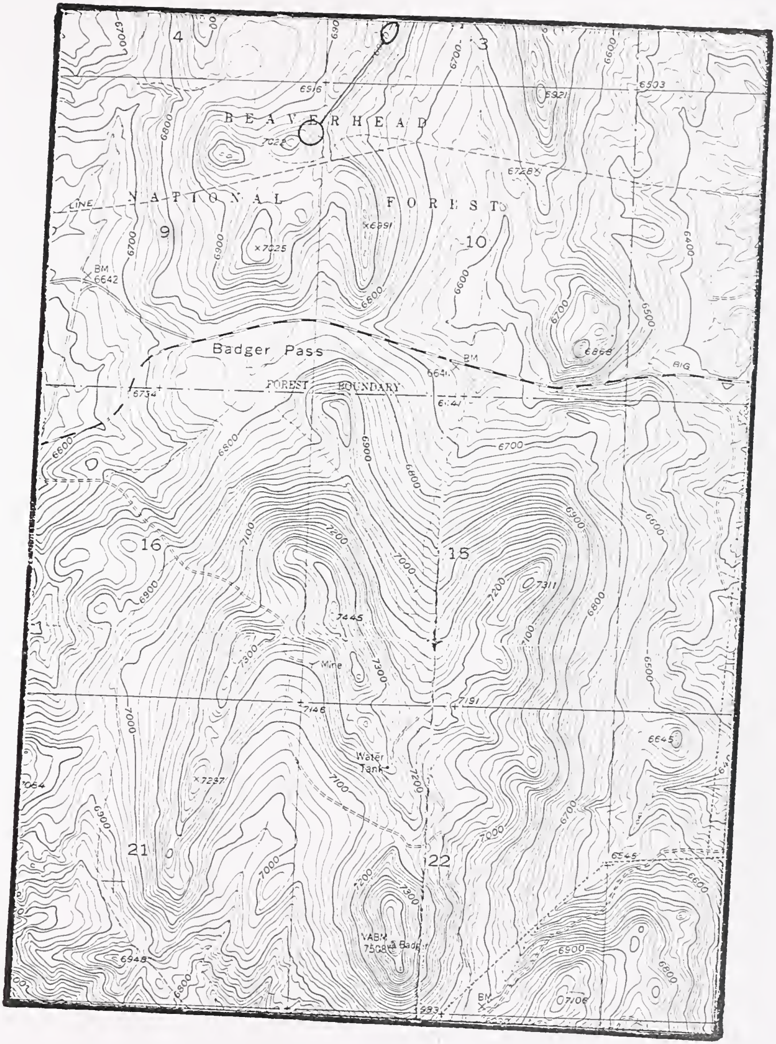
General site description:
BROWN LOAM SOILS; ARTEMISIA TRIDENTATA/FESTUCA IDAHOENSIS, WITH PSEUDOTSUGA MENZIESII, BALSAMORHIZA SAGITTATA, LUPINUS SERICEUS, ANTENNARIA MICROPHYLLA, ASTER STENOMERES.

Land owner/manager:
BEAVERHEAD NATIONAL FOREST, DILLON RANGER DISTRICT

Comments:

Information source: SHELLY, J. S. 1987. [FIELD SURVEYS IN BEAVERHEAD COUNTY OF 16-19 JUNE.]

Specimens: SHELLY, J. S. (1343). 1987. MONTU.



4
3
B E A V E R H E A D
N A T I O N A L
F O R E S T
LINE
9
10
BM
6642
Badger Pass
FOREST
BOUNDARY
BM
16
15
Mine
21
22
Water
Tank
VABM
7508
6503
6921
6728
6891
7025
6868
6734
6700
6900
7200
7000
7100
7311
7445
7300
7146
7191
6645
7237
6545
6948
7106
6600
6800
6500
6400

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS
Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.040
Element occurrence type:

Survey site name: ERMONT GULCH
EO rank: B
EO rank comments: POSSIBLE THREATS FROM GRAZING OR COMPETITION.

County: BEAVERHEAD

USGS quadrangle: ERMONT

Township:	Range:	Section:	TRS comments:
006S	011W	27	SE4SW4

Precision: S
Survey date: 1990-06-28 Elevation: 6800 -
First observation: 1990 Slope/aspect: 8-15% / SOUTHEAST
Last observation: 1990-06-28 Size (acres): 0

Location:
CA. 3.5 MILES WEST OF ARGENTA, JUST WEST OF FS ROAD #7467.

Element occurrence data:
2 BLOOMING PLANTS (28 JUNE 1990).

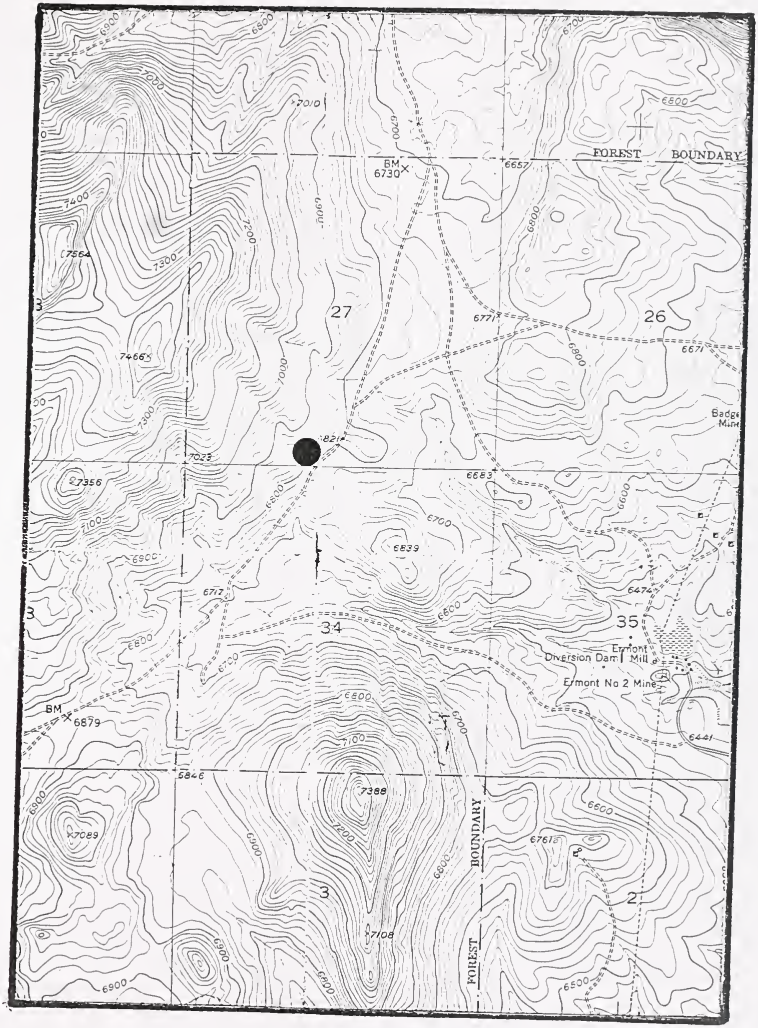
General site description:
ARTEMISIA TRIDENTATA/FESTUCA IDAHOENSIS COMMUNITY, WITH PENSTEMON ARIDUS, P. WHIPPLEANUS, P. RADICOSUS, KOELERIA CRISTATA, TARAXACUM OFFICINALE, PSEUDOTSUGA MENZIESII, SENECIO SPP.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
NONFLOWERING PLANTS NOT SEARCHED FOR.

Information source: HEINZE, DONALD. BUREAU OF LAND MANAGEMENT, 222 NORTH 32ND STREET, P.O. BOX 36800, BILLINGS, MT 59107-6800. 406/255-2913.

Specimens:



FOREST BOUNDARY
BM 6730
6657
7010
7564
7400
7300
27
26
6771
6671
7466
Badger Mine
7023
6821
7356
6683
6839
6717
6474
34
35
Ermont
Diversion Dam
Mill
Ermont No 2 Mine
BM 6879
6441
6846
7388
7089
6761
3
2
7108
FOREST BOUNDARY

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.006
Element occurrence type:

Survey site name: BANNACK
EO rank: AB
EO rank comments: LARGE POPULATION, PRIME POTENTIAL HABITAT, POTENTIAL WEED COMPETITION.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	5	S2

Precision: S
Survey date: 1995-06-14 Elevation: 6200 - 7000
First observation: 1995-06-14 Slope/aspect: 15-80% / S, E, W
Last observation: 1995-06-14 Size (acres):

Location:
BANNACK STATE PARK; RIDGE NORTHEAST OF TOWNSITE AND NEXT RIDGE SYSTEM TO EAST ON BLM LANDS.

Element occurrence data:
OVER 1000 PLANTS, IN EARLY FLOWERING 14 JUNE 1995. DISTRIBUTED IN PATCHES ACROSS RIDGE COMPLEX WITH CORE SUBPOPULATIONS ON THE TWO RIDGES.

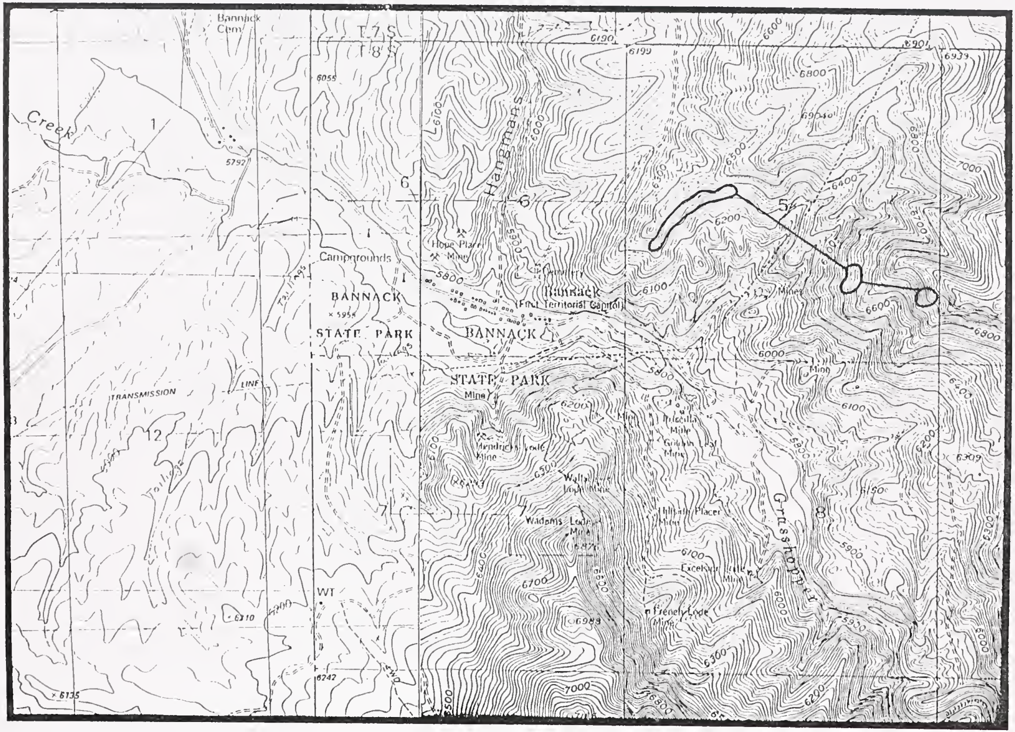
General site description:
EXPOSED LIMESTONE RIDGE SLOPES WITH OUTCROP AND COLLUVIUM COMBINATION, DOMINATED BY CERCOCARPUS LEDIFOLIUS AND AGROPYRON SPICATUM. OFTEN MOST COMMON ON LEAF LITTER BELOW CERCOCARPUS. ASSOCIATED SPECIES: ORYZOPSIS HYMENOIDES, ARTEMISIA FRIGIDA, DESCURAINIA RICHARDSONII, THLASPI ARVENSE.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
BANNACK STATE HISTORIC PARK

Comments:

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1346). 1995. MONT.



Bannack Cem
T 7 S
T 8 S
Creek
Hangmans
Hope Placer Mine
Campgrounds
BANNACK
STATE PARK
Bannack (First Territorial Capitol)
BANNACK
STATE PARK
TRANSMISSION
LINE
Tailings
Hendricks Lode Mine
Wadams Lode Mine
Excelsior Lode Mine
French Lode Mine
Grasshopper
Mine
WT

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.007
Element occurrence type:

Survey site name: CLARK CANYON RESERVOIR
EO rank: B
EO rank comments: POPULATION MAY HAVE YET TO BECOME WELL-ESTABLISHED IN POTENTIAL HABITAT.

County: BEAVERHEAD

USGS quadrangle: GARFIELD CANYON

Township:	Range:	Section:	TRS comments:
010S	010W	6	NE4NW4

Precision: S
Survey date: 1995-07-21 Elevation: 6050 -
First observation: 1995-07-21 Slope/aspect: 15-25% / SOUTH
Last observation: 1995-07-21 Size (acres):

Location:
CA. 6.5 MILES NORTHWEST OF RED ROCK, 0.75 MILE NORTH OF NORTH SHORE OF CLARK CANYON RESERVOIR.

Element occurrence data:
ONLY 1 HIGHLY LOCALIZED POPULATION OF OVER 200 PLANTS WAS FOUND IN AN AREA OF 10 X 10 M. PLANTS WERE IN A WIDE RANGE OF PHENOLOGY, THOSE IN THE OPEN TURNING RED AND WITHERING, WHILE THOSE UNDER CERCOCARPUS WERE GREEN, MORE ROBUST, AND INCLUDED MANY THAT STILL HAD FLOWERS.

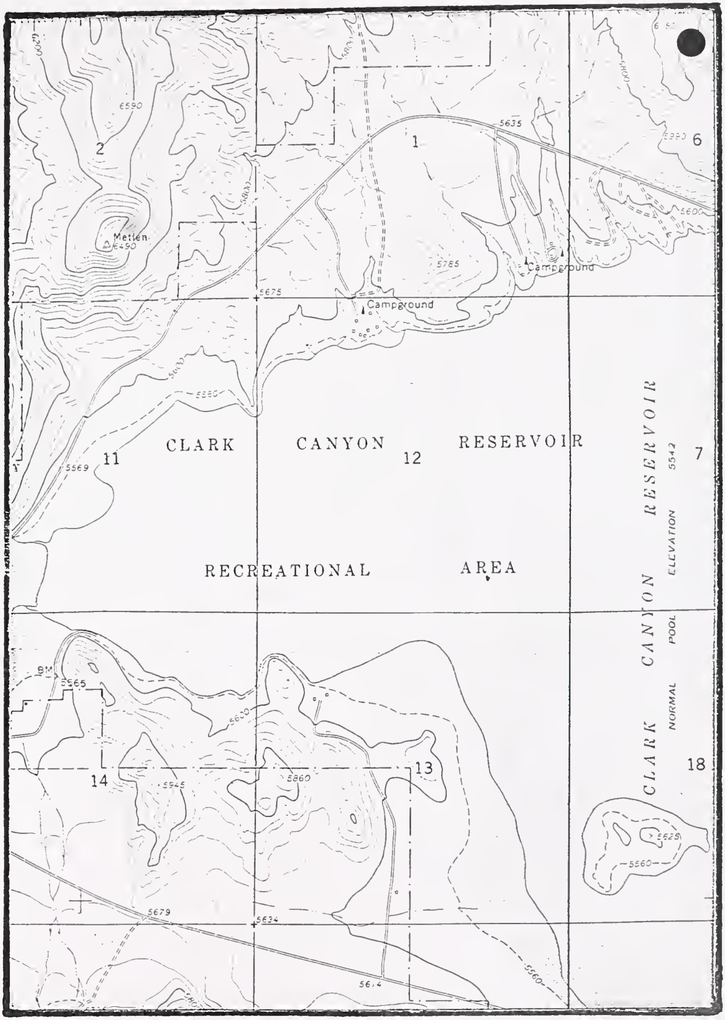
General site description:
EXPOSED LIMESTONE TALUS TO COBBLER RIDGESLOPE AND MIDSLOPE POSITION, ON ABRUPT OUTCROPS ABOVE CANYON CREEK RESERVOIR. MADISON GROUP PARENT MATERIAL. IN CERCOCARPUS LEDIFOLIUS/AGROPYRON SPICATUM HABITAT TYPE; ALSO ASSOCIATED WITH GUTIERRIZIA SAROTHRAE, PENSTEMON AVIDUS, ERIGERON TWEEDYI, ORYZOPSIS HYMENOIDES, CHENOPODIUM (WATSONII), ARENARIA KINGII, ALLIUM TEXTILE, OROBANCHE LUDOVICIANA, EUROTIA LANATA.

Land owner/manager:
CLARK CANYON RESERVOIR
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SURVEYED BY B. HEIDEL. HEAVY DISTURBANCE BY MULE DEER BROWSING AND SCAT.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1401). 1995. MONTU.


CLARK CANYON RESERVOIR
RECREATIONAL AREA
CLARK CANYON RESERVOIR
NORMAL POOL ELEVATION 5542
Campground
Campground
Metlen
1
2
6
7
11
12
13
14
18
5635
5675
5785
5569
5565
5945
5860
5679
5634
5625
5560

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA SCOPULINA
Common Name: DWARF PHACELIA

Global rank: G4 Forest Service status:
State rank: SH Federal Status:

Element occurrence code: PDHYD0C490.001
Element occurrence type:

Survey site name: MELROSE
EO rank:
EO rank comments:

County: SILVER BOW
MADISON

USGS quadrangle: MELROSE

Township:	Range:	Section:	TRS comments:
002S	009W	26	

Precision: G
Survey date: Elevation: 5180 -
First observation: 1885 Slope/aspect:
Last observation: 1885 Size (acres):

Location:
MELROSE (HISTORIC RECORD, GENERAL LOCATION ONLY).

Element occurrence data:

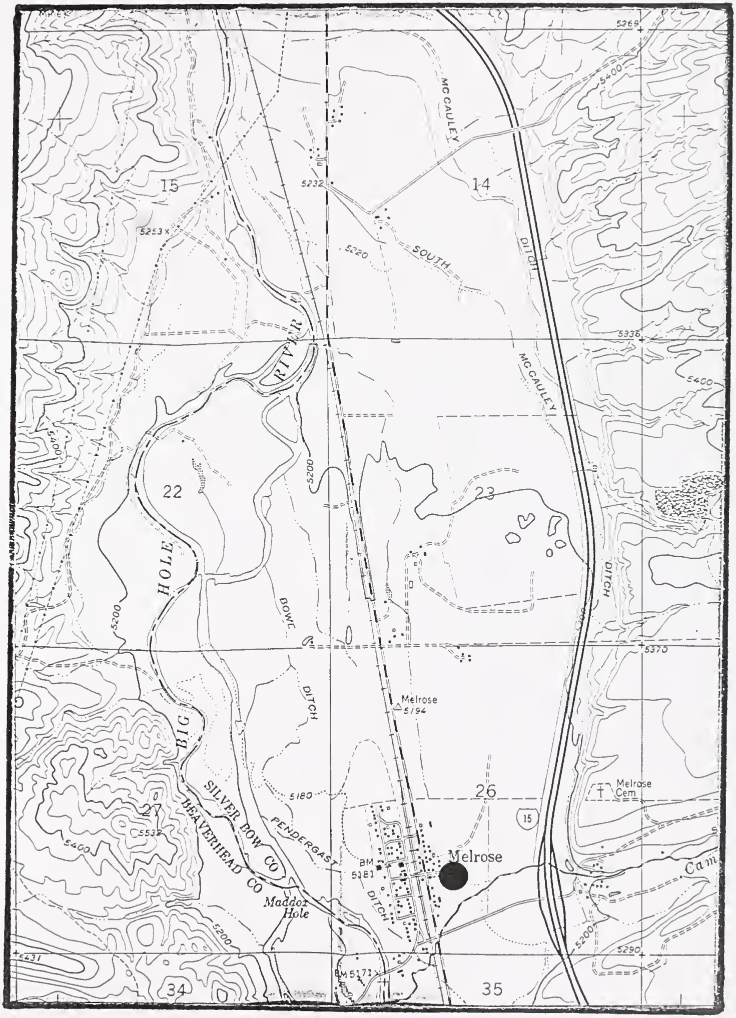
General site description:

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:

Information source: BOTANIST, MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, HELENA, MT 59620-1800.

Specimens: RYDBERG, P. A. (2771). 1895. NY.


15
14
22
23
27
26
34
35
MC CAULEY
SOUTH
DITCH
MC CAULEY
DITCH
BIG HOLE RIVER
BOWL
DITCH
SILVER BOW CO
BEAVERHEAD CO
PENDERGAST
DITCH
Maddox Hole
Melrose
BM 5181
BM 5171
Melrose 5194
Melrose Cem
15
5232
5253
5220
5200
5180
5400
5532
5269
5336
5370
5290
5431

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.004
Element occurrence type:

Survey site name: ROCKY HILLS
EO rank: A
EO rank comments: NEAR PRISTINE.

County: BEAVERHEAD

USGS quadrangle: GRANT

Township:	Range:	Section:	TRS comments:
009S	012W	1	S2; 12 NE4

Precision: S
Survey date: 1994-06-29 Elevation: 6400 - 6800
First observation: 1994-06-29 Slope/aspect: 20% / SW
Last observation: 1994-06-29 Size (acres):

Location:
CA. 5 MILES NORTH OF GRANT ON GRAVEL ROAD TO BANNACK STATE PARK, TURN EAST ON DIRT ROAD AND FOLLOW TO ROCKY WELL. TRAVEL OVERLAND CA. 1.5 AIR MILES WNW. PLANTS ARE ON SOUTHWEST SLOPES OF ROCKY HILLS.

Element occurrence data:
5000-10,000 PLANTS WITH 3 SUBPOPULATIONS, 100% IN EARLY BUD. SOME INFECTED WITH FUNGUS (RUST?).

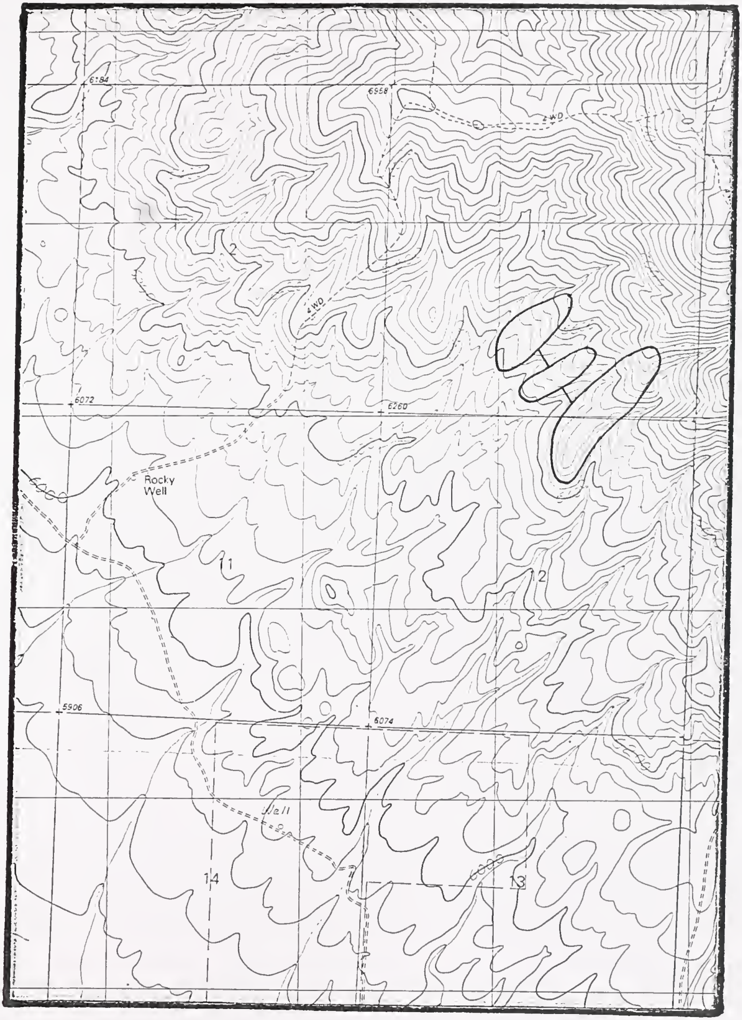
General site description:
DRY, OPEN RESIDUAL MIDSLOPE. LIMESTONE PARENT MATERIAL, GRAVELLY CLAY SOIL. ASSOCIATED SPECIES: PINUS FLEXILIS, CERCOCARPUS LEDIFOLIUS, ELYMUS SPICATUS, HAPLOPAPPUS ACAULIS, KOELERIA MACRANTHA, ERIGERON TWEEDYI, ERIGERON COMPOSITUS, PENSTEMON ARIDUS, IVESIA GORDONII, PENSTEMON ERIANTHERUS, JUNIPERUS SCOPULORUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5211). 1994. MONT.


6958
4WD
2
4WD
6072
6260
Rocky
Well
11
12
5906
6074
Well
14
13

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.005
Element occurrence type:

Survey site name: BANNACK
EO rank: A
EO rank comments: NEAR-PRISTINE SITE.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	5	SW4NW4

Precision: S
Survey date: 1994-06-12 Elevation: 6320 - 6440
First observation: 1994-06-12 Slope/aspect: 0-30% / WNW
Last observation: 1994-06-12 Size (acres): 40

Location:
SITE IS ON FIRST RIDGE NORTHEAST OF BANNACK, OVERLOOKING TOWNSITE.

Element occurrence data:
1000-10,000 PLANTS, 100% FLOWERING.

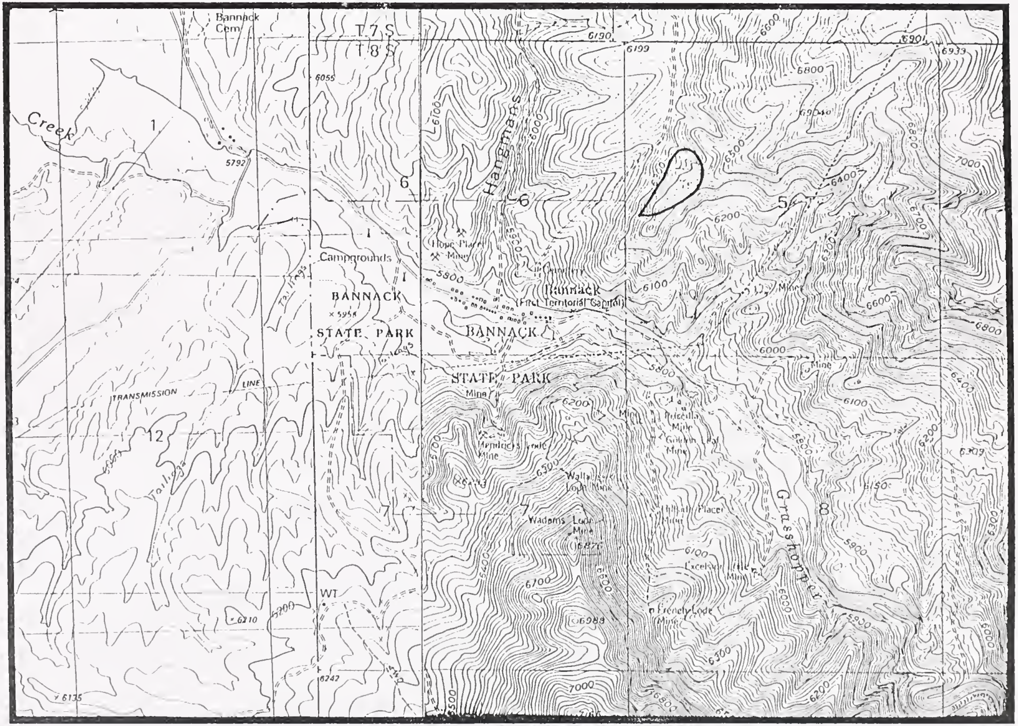
General site description:
DRY, OPEN RESIDUAL UPPERSLOPE AND RIDGE CREST. LIMESTONE PARENT MATERIAL, GRAVELLY CLAY SOIL. ASSOCIATED SPECIES: ELYMUS SPICATUS, CERCOCARPUS LEDIFOLIUS, PINUS FLEXILUS, ARTEMISIA FRIGIDA, HAPLOPAPPUS ACAULIS, PENSTEMON ARIDUS, OXYTROPIS LAGOPUS, LINUM LEWISII, DELPHINIUM BICOLOR SSP. NOVUM, TOWNSENDIA SPATHULATA, LESQUERELLA SP., LOMATIUM ATTENUATUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
THIS NEAR-PRISTINE SITE HOSTS FIVE LIMESTONE ENDEMIC PLANT SPECIES OF CONCERN. BANNACK STATE PARK IS APPLYING FOR A LAND TRANSFER WHICH MAY HELP PROTECT THE SITE FROM FUTURE MINING.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5188). 1994. MONT.


Bannack Cem
T 7 S
T 8 S
Creek
Hangmans
Campgrounds
BANNACK
STATE PARK
Bannack
(First Territorial Capital)
BANNACK
STATE PARK
Hope Placer Mine
TRANSMISSION
LINE
Tailings
Grasshopper
Wadams Lode Mine
Excelsior Lode Mine
Friendly Lode Mine
WT
5792
6055
6190
6199
6933
6988
6210
6242
6135

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.006
Element occurrence type:

Survey site name: ROCKY HILLS
EO rank: B
EO rank comments: LIMITED SIZE, GOOD CONDITION.

County: BEAVERHEAD

USGS quadrangle: GRANT

Township:	Range:	Section:	TRS comments:
008S	011W	30	NW4; 19 SW4

Precision: S
Survey date: 1995-07-22 Elevation: 6800 - 7000
First observation: 1995-07-22 Slope/aspect: 1-10% / SOUTH, SW
Last observation: 1995-07-22 Size (acres): 5

Location:
CA. 2.5 MILES DUE SOUTH OF BANNACK HWY ON COUNTY ROAD. CA. 3 MILES EAST ON BLM RD 1827, CA. 0.5 MILE ON 2-TRACK FORK TO RIDGE. POPULATIONS LIE 0.2-0.5 MILE NORTH.

Element occurrence data:
>200 PLANTS IN 2 SUBPOPULATIONS, EACH WITH >100 PLANTS. FRUITING WITH A FEW PLANTS IN LATE FLOWER.

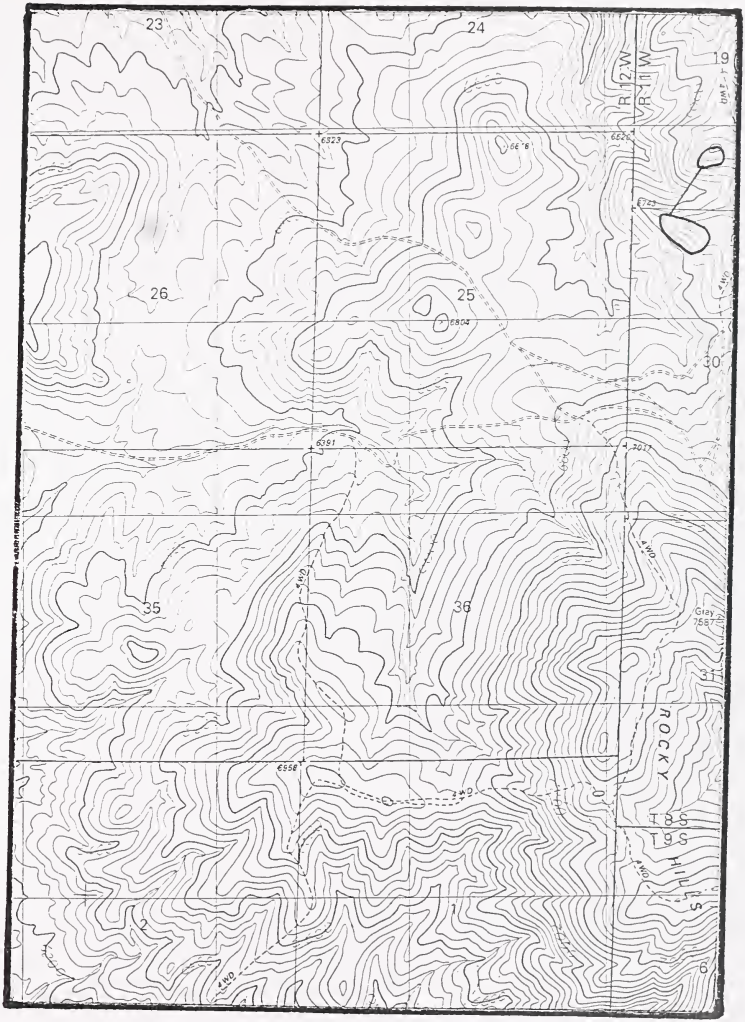
General site description:
RESTRICTED TO MICROHABITAT PATCHES. OPEN LIMESTONE GRAVEL OVER SLIT UPPERSLOPE ASSOCIATED WITH ROCK OUTCROPS. MADISON GROUP PARENT MATERIAL. ASSOCIATED SPECIES: AGROPYRON SPICATUM (SPARSE PHASE), PENSTEMON ARIDUS, ARTEMISIA ARBUSCULA, PETROPHYTON CAESPITOSUM, DELPHINIUM SPP., LOMATIUM ATTENUATUM, POA SCABRELLA, TOWNSENDIA NUTTALLII, ERIOGONUM MANCUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SURVEYED BY B. HEIDEL. AREA TO THE NORTH IS EXTENSIVELY MINED, ALTHOUGH THERE ARE FEW ADITS AROUND PLANTS.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:


23
24
19
R 12 W
R 11 W
6523
6620
6743
26
25
6804
30
6391
7017
35
36
Gray
7587
31
ROCKY
HILLS
6558
4WD
T 8 S
T 9 S
2
1
6

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.007
Element occurrence type:

Survey site name: TENMILE HOUSE
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BURNS MOUNTAIN

Township:	Range:	Section:	TRS comments:
007S	010W	21	NW4

Precision: S
Survey date:
First observation: 1995-07-09
Last observation: 1995-07-09

Elevation: 5900 -
Slope/aspect: 5% / EAST
Size (acres): 1

Location:
CA. 10 AIR MILES WEST OF DILLON AND CA. 1 MILE SOUTHWEST OF TENMILE HOUSE (JUNCTION OF HWY 278 WITH THE BON ACCORD ROAD).

Element occurrence data:
CA. 50 PLANTS, 70% EARLY FLOWERING, 30% VEGETATIVE.

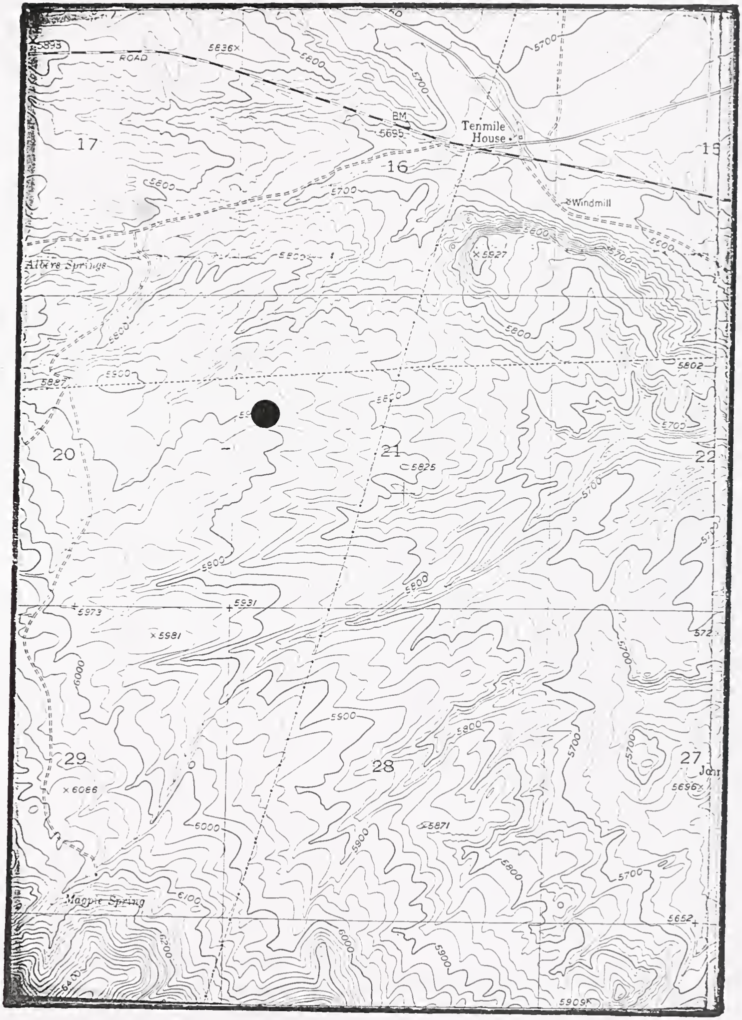
General site description:
OPEN, DRY CREST, GRAVELLY LOAM. ARTEMISIA ARBUSCULA HABITAT TYPE. ASSOCIATED SPECIES: STIPA COMATA, ARTEMISIA FRIGIDA, PHLOX MUSCOIDES, PENSTEMON ARIDUS, OXYTROPIS SERICEA, ELYMUS SPICATUS, ERIGERON COMPOSITUS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
OBSERVED BY J. VANDERHORST. MODERATE GRAZING IN THE PAST.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5438). 1995. MONT.


ROAD
5836
5800
5700
BM
5695
Tenmile House
17
16
15
Windmill
5700
5927
Albers Springs
5800
5900
5887
5802
20
21
22
5825
5973
5931
5981
6000
29
28
27
6086
5871
5652
Magpie Spring
6100
6200
5909

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.008
Element occurrence type:

Survey site name: CEDAR CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: ELI SPRING

Township:	Range:	Section:	TRS comments:
009S	011W	35	SE4

Precision: S
Survey date:
First observation: 1995-07-20
Last observation: 1995-07-20

Elevation: 6120 - 6240
Slope/aspect: 0-5% / NORTH
Size (acres): 2

Location:
TRAVEL CA. 4 MILES WEST OF ARMSTEAD ON US HWY 324, NORTH 1 MILE TO THE FORK, AND WEST 0.2 MILE PAST GATE AND BLM ROAD 1800 SIGN. POPULATION IS SOUTH OF ROAD.

Element occurrence data:
LOCALLY COMMON, >300 PLANTS, IN FRUIT. MOST PLANTS <10 X 10 CM.

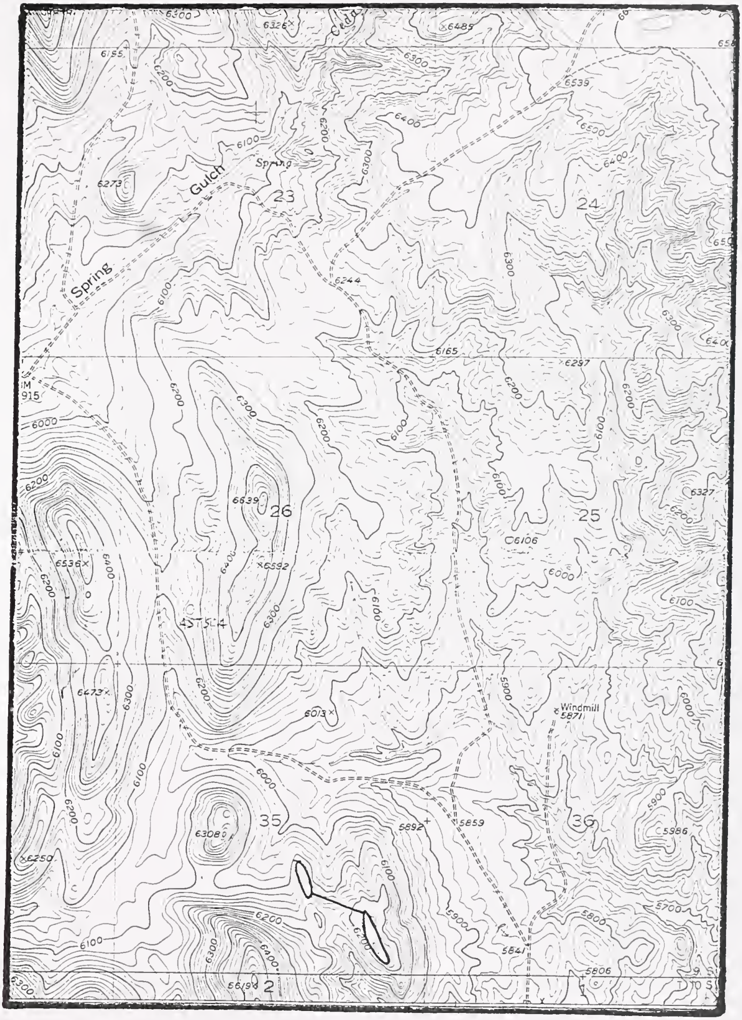
General site description:
SEGMENT OF OPEN, DRY, HARSH FLAT RIDGETOP COVERED BY LIMESTONE PAVEMENT. MADISON GROUP PARENT MATERIAL, SILT COVERED BY GRAVEL AND SMALL ROCKS. PHLOX BRYOIDES, HAPLOPAPPUS ACAULIS, ARTEMISIA FRIGIDA, POSSIBLY EARLY SUCCESSIONAL PHASE OF AGROPYRON SPICATUM, ORYZOPSIS HYMENOIDES, O. CONTRACTA; SOME OVERLAP WITH SPHAEROMERIA CAPITATA, THE LOCAL DOMINANT IN THE AREA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
ALMOST NO DISTURBANCE; SIGNS OF AN OCCASIONAL HORSE.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:


Spring
Gulch
Spring
Cedar
23
24
26
25
35
36
2
1
6300
6326
6485
6155
6200
6539
6400
6500
6100
6273
6244
6165
6297
6000
6639
6536
6592
6106
6327
6473
6013
Windmill
5871
5900
6308
5892
5859
5986
6250
5700
5800
5841
5806
6619
T 10 S

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDAST8S010.009
Element occurrence type:

Survey site name: ERMONT GULCH
EO rank: B
EO rank comments: GOOD SIZE, DISSECTED BY ROAD.

County: BEAVERHEAD

USGS quadrangle: ARGENTA
BURNS MOUNTAIN

Township:	Range:	Section:	TRS comments:
007S	010W	6	SE4; 5 SW4

Precision: S
Survey date: 1995-06-14 Elevation: 5980 - 6020
First observation: 1995-06-14 Slope/aspect: 0-4% / SOUTH
Last observation: 1995-07-21 Size (acres): 10

Location:
TRAVEL CA. 10 MILES DUE WEST OF DILLON FROM US HYW 91. TAKE BADGER PASS EXIT CA. 6.5 MILES WEST AND GO CA. 3 MILES NORTHWEST ON ERMONT GULCH ROAD. POPULATION IS ON IMMEDIATE SOUTH AND NORTH SIDES OF ROAD IN A BAND OF HABITAT PARALLELING ROAD FOR NEXT 0.3 MILE.

Element occurrence data:
OCCASIONAL, OVER 200 VIGOROUS CLUMPS OF PLANTS, MOST 1-2 DM IN DIAMETER. IN EARLY FLOWER 14 JUNE 1995.

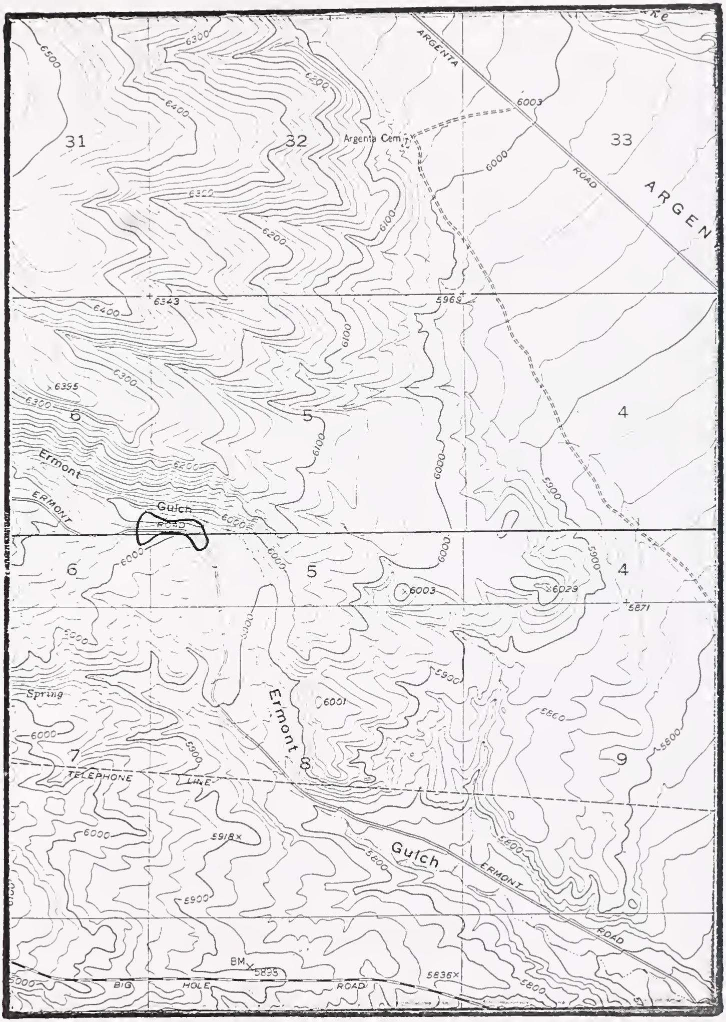
General site description:
SPANNING 0.3 MILE OF HABITAT ORIENTED IN A SINGLE BAND. STRAIGHT CREST ALONG TOP OF LOW RIDGE IN THE BROAD, OPEN ERMONT GULCH FOOTHILLS HABITAT. IN ARTEMISIA ARBUSCULA/AGROPYRON SPICATUM HABITAT TYPE. ALSO ASSOCIATED WITH ARENARIA KINGII, POA SECUNDA, PENSTEMON ARIDUS, PHLOX BRYOIDES. THE DRY SILTY HABITAT IS DISSECTED BY THE ERMONT GULCH ROAD.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SURVEYED BY B. HEIDEL. SITE HAS NUMEROUS CATTLE HOOF PRINTS BUT IS UNPRODUCTIVE AND FAR ENOUGH FROM ROAD THAT IT IS STILL IN GOOD CONDITION.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1344). 1995. MONTU.


ARGENTA
ROAD
ARGEN
Argenta Cem.
31
32
33
6
5
4
6
5
4
7
8
9
Ermont
ERMONT
Gulch
ROAD
Spring
Ermont
TELEPHONE
LINE
Gulch
ERMONT
ROAD
BM
5898
5836
BIG
HOLE
ROAD
6003
5969
6343
6395
6003
6029
5871
6001
5918

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: STEPHANOMERIA SPINOSA
Common Name: SPINY SKELETONWEED

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST8U0E0.002
Element occurrence type:

Survey site name: MOOSE CREEK
EO rank:
EO rank comments:

County: MADISON

USGS quadrangle: SQUAW CREEK

Township:	Range:	Section:	TRS comments:
010S	001E	16	N2

Precision: M
Survey date: 1933-07-14 Elevation: 6200 -
First observation: 1933 Slope/aspect:
Last observation: 1933-07-14 Size (acres): 0

Location:
NEAR GALLATIN FOREST. MOOSE CREEK CANYON COVER. EAST OF MADISON RIVER.

Element occurrence data:
RARE.

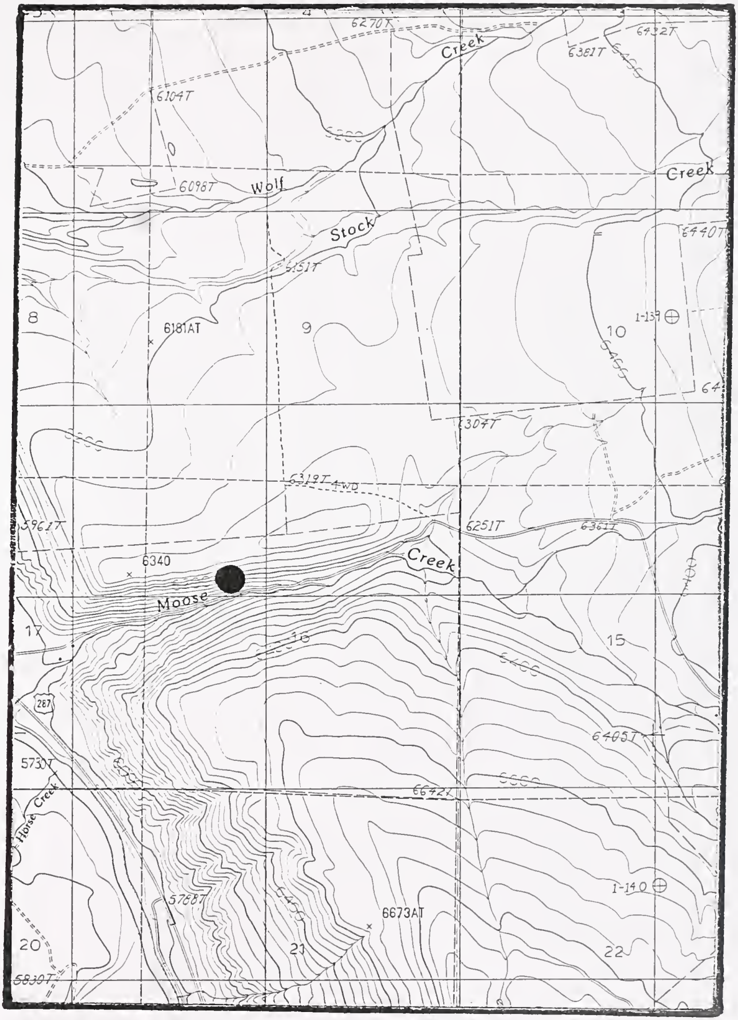
General site description:
20% SOUTH SLOPE. IN DRY SITES.

Land owner/manager:
STATE LAND - UNDESIGNATED
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
NONE.

Information source: BOTANIST, MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, HELENA, MT 59620-1800.

Specimens: WITHAM AND FRY (1440). 1933. SPECIMEN #480662 RM.



Creek
Wolf
Creek
Stock
Moose
Creek
Horse Creek
6270T
6432T
6381T
6104T
6098T
6151T
6440T
8
6181AT
9
10
1-139
6304T
6319T
4WD
5961T
6251T
6361T
6340
17
16
15
287
6405T
5730T
6642T
1-140
5768T
6673AT
20
21
22
5830T

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: STEPHANOMERIA SPINOSA
Common Name: SPINY SKELETONWEED

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST8U0E0.003
Element occurrence type:

Survey site name: MADISON BENCH
EO rank:
EO rank comments:

County: MADISON

USGS quadrangle: GRANITE MOUNTAIN

Township:	Range:	Section:	TRS comments:
010S	001E	06	S2

Precision: S
Survey date: 1990-07-19 Elevation: 5660 - 5810
First observation: 1990 Slope/aspect: 0-3% / LEVEL, WEST
Last observation: 1995-07-26 Size (acres): 10

Location:
FROM CAMERON, TAKE HWY. 287 SOUTH 14 MILES TO BLM RECREATION AREA. CONTINUE SOUTH 0.25 MILE; SITE IS ON EAST SIDE OF HWY. JUST EAST OF FENCE.

Element occurrence data:
1995: NEW WESTERN SUBPOPULATION WITH 11 PLANTS, 90 % IN EARLY BUD, 10% VEGETATIVE. 1990: (EASTERN SUBPOPULATION) 11-50 PLANTS IN BUD. ONLY SMALL AREA SURVEYED; FULL EXTENT OF OCCURRENCE IS UNKNOWN.

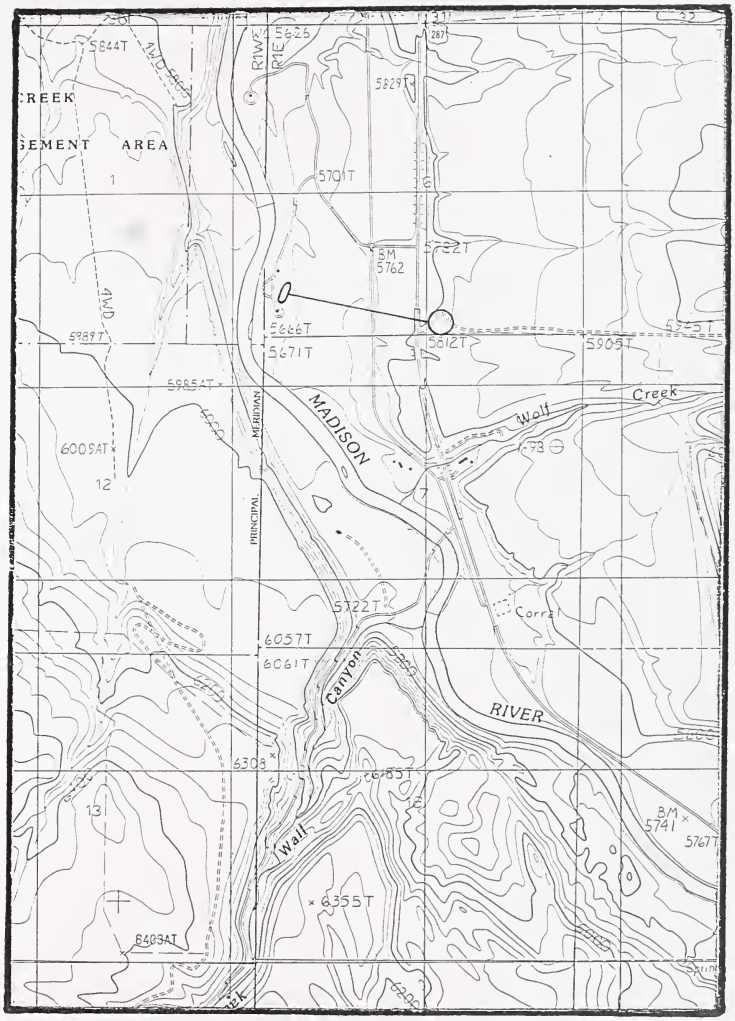
General site description:
DRY, OPEN CREST OF LOWER ALLUVIAL BENCH. SANDY, ROCKY LOAM. FESTUCA IDAHOENSIS/STIPA COMATA COMMUNITY. ASSOCIATED SPECIES: POA SANDBERGII, ARTEMISIA FRIGIDA, ASTRAGALUS ADSURGENS, A. TERMINALIS, SELAGINELLA DENSA, ELYMUS SPICATUS, ANTENARIA MICROPHYLLA, BOUTELOUA GRACILIS, SENECIO CANUS, ASTRAGALUS MISER.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
RANGE CONDITION INDICATES LIGHT GRAZING. SITE SURVEY SUMMARY ON FILE AT MTNHP.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812. PHONE 406/728-8740.

Specimens: LESICA, P. (5188). 1990. MONTU.
VANDERHORST, J. (5478). 1995. MONTU.


CREEK
GEMENT AREA
5844T
5625
5829T
5701T
BM 5762
5722T
5666T
5671T
5612T
5905T
5989T
5985AT
6009AT
MADISON
Wolf
Creek
PRINCIPAL MERIDIAN
6057T
6061T
Canyon
RIVER
Corral
6308
6355T
6403AT
BM 5741
5767T
4WD

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: STEPHANOMERIA SPINOSA
Common Name: SPINY SKELETONWEED

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST8U0E0.005
Element occurrence type:

Survey site name: MADISON RIVER
EO rank: A
EO rank comments: HIGH DENSITY DESPITE GRAZING, SUGGESTING THAT SPECIES IS AN "INCREASER" HERE.

County: MADISON

USGS quadrangle: CAMERON
BUCKS NEST

Township:	Range:	Section:	TRS comments:
008S	001W	24	N2; 14 NE4

Precision: S
Survey date: 1995-09-01 Elevation: 5400 - 5420
First observation: 1995-07-26 Slope/aspect: LEVEL
Last observation: 1995-09-01 Size (acres): 200

Location:
MADISON RIVER, CA. 16 MILES SOUTH OF ENNIS ON US HWY 287. PLANTS ARE SCATTERED ON ALLUVIAL BENCHES ON EAST SIDE OF RIVER.

Element occurrence data:
200+ WIDELY SCATTERED PLANTS IN 2 SUBPOPULATIONS. 90% EARLY FLOWER BUD IN JULY, LATE FLOWER AND FRUIT IN AUGUST, PRODUCING NEW FLOWERS THROUGH FROST WITH SUFFICIENT RAINFALL.

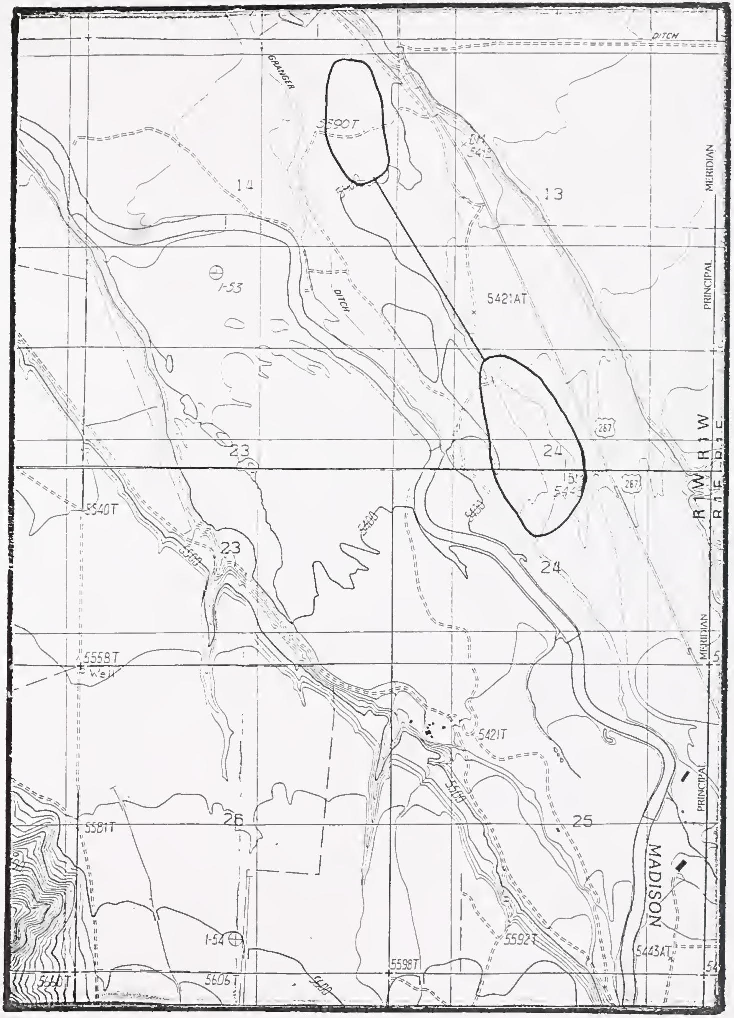
General site description:
OPEN, DRY SANDY CRESTS AND BOTTOMS. COARSE ALLUVIUM PARENT MATERIAL, SANDY ROCKY SOIL. STIPA COMATA/BOUTELOUA GRACILIS HABITAT TYPE. ASSOCIATED SPECIES: ELYMUS SPICATUS, SELAGINELLA DENSA, ASTRAGALUS TERMINALIS, OXYTROPIS SERICEA, CHRYSOPSIS VILLOSA, PARONYCHIA SESSILIFLORA, MUSINEON DIVARICATUM, PHLOX HOODII, ARTEMISIA FRIGIDA, BROMUS TECTORUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
OBSERVED IN JULY BY J. VANDERHORST AND SURVEYED IN SEPTEMBER BY B. HEIDEL. SITE NOT SURVEYED BEYOND CANAL OR BLM BOUNDARIES. SITE IS HEAVILY GRAZED; OTHER SPECIES GROWING HERE ARE PROTECTED FROM GRAZING.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5486). 1995. MONT.
HEIDEL, B. (1418). 1995. MONTU.


DITCH
GRANGER
5590T
14
13
1-53
DITCH
5421AT
MERIDIAN
PRINCIPAL
23
24
287
R 1 W
R 1 W
5540T
23
24
5558T
Well
5421T
26
25
5581T
MADISON
1-54
5592T
5443AT
5598T
5606T

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: STEPHANOMERIA SPINOSA
Common Name: SPINY SKELETONWEED

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST8U0E0.006
Element occurrence type:

Survey site name: MADISON RIVER
EO rank: BC
EO rank comments: GOOD-FAIR POPULATION SIZE.

County: MADISON

USGS quadrangle: BUCKS NEST

Township:	Range:	Section:	TRS comments:
009S	001W	23	NE4; 13 SE4SW4; 14 SE4; 24 SW4NW4

Precision: S
Survey date: 1995-08-31 Elevation: 5600 - 5720
First observation: 1995-07-25 Slope/aspect: 0% / EAST
Last observation: 1995-08-31 Size (acres):

Location:
CA. 1 MILE SOUTH OF BLM WEST MADISON RECREATION AREA CAMPGROUND, ON ALLUVIAL BENCHES WEST OF MADISON RIVER.

Element occurrence data:
EXTENSIVE POPULATION IN VERY LOW DENSITY ON BOTH SIDES OF MADISON RIVER VALLEY. IN EARLY BUD 25 JULY 1995 AND LATE FLOWERING 31 AUG 1995.

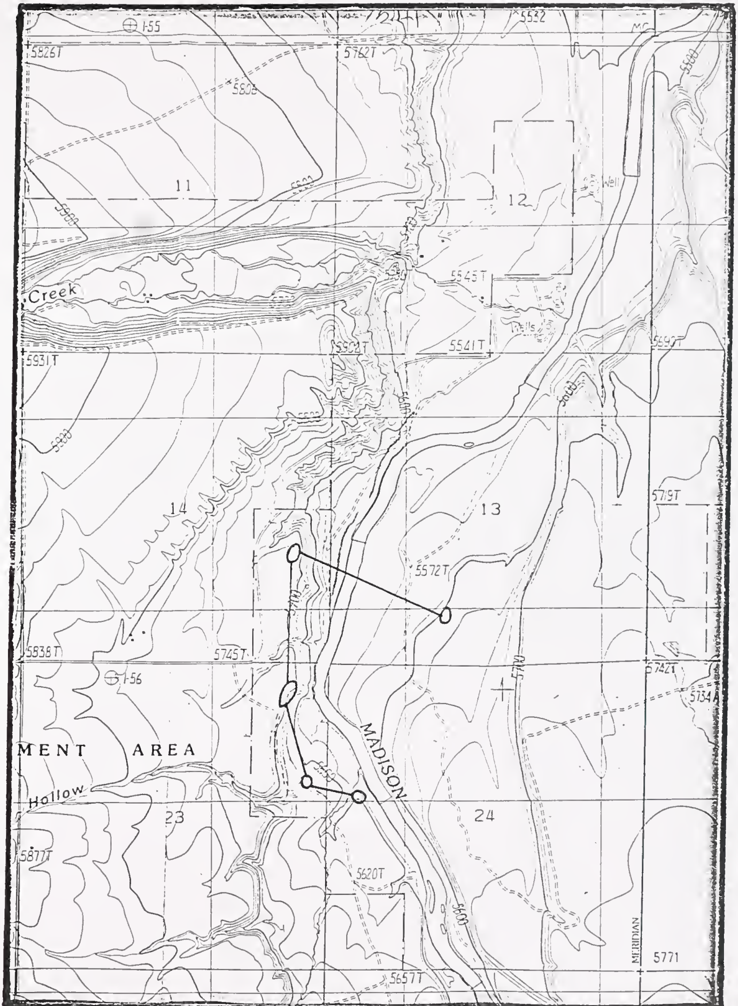
General site description:
ALLUVIAL BENCHES ALONG MADISON RIVER VALLEY COVERED BY DRY GRASSLAND AND DOMINATED BY COMBINATIONS OF AGROPYRON SPICATUM, STIPA COMATA, AND SELAGINELLA DENSA. OTHER ASSOCIATED SPECIES INCLUDE: CHRYSOPSIS VILLOSA, KOELERIA MACRANTHA, GUTIERREZIA SAROTHRAE, ARTEMISIA FRIGIDA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SURVEYED BY J. VANDERHORST 25 JULY 1995 AND BY B. HEIDEL 31 AUG 1995.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: VANDERHORST, J. (5471). 1995. MONT.



I-55
5532
5826T
5762T
5808
11
12
Well
Creek
5545T
Wells
5541T
5508T
5931T
5690T
14
13
5719T
5572T
5838T
5745T
I-56
5742T
5734A
MENT
AREA
MADISON
Hollow
23
24
5877T
5620T
5657T
MERIDIAN
5771

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: TARAXACUM ERIOPHORUM
Common Name: ROCKY MOUNTAIN DANDELION

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST930G0.006
Element occurrence type:

Survey site name: HENNEBERRY RIDGE
EO rank: C
EO rank comments: POSSIBLY GOOD POPULATION SIZE, BUT DEGRADED HABITAT, REDUCED REPRODUCTION.

County: BEAVERHEAD

USGS quadrangle: ELI SPRING

Township:	Range:	Section:	TRS comments:
009S	011W	10	NE4; 3 SW4SE4

Precision: S
Survey date: 1995-06-15 Elevation: 6550 - 6580
First observation: 1995-06-15 Slope/aspect:
Last observation: 1995-06-15 Size (acres): 5

Location:
CA. 18 MILES SOUTHWEST OF DILLON. OPEN MEADOWS ABOVE ELI SPRING.

Element occurrence data:
ESTIMATED OVER 1000 PLANTS, MOST IN ROSETTE FORM AND SIMILAR TO IMMATURE CREPIS. IN FRUIT AND LATE FLOWERING 15 JUNE 1995. ARTIFICIALLY DRY MICROHABITAT CONDITIONS MAY REDUCE FLOWERING, BUT OPEN SOIL CONDITIONS PROMOTE RECRUITMENT.

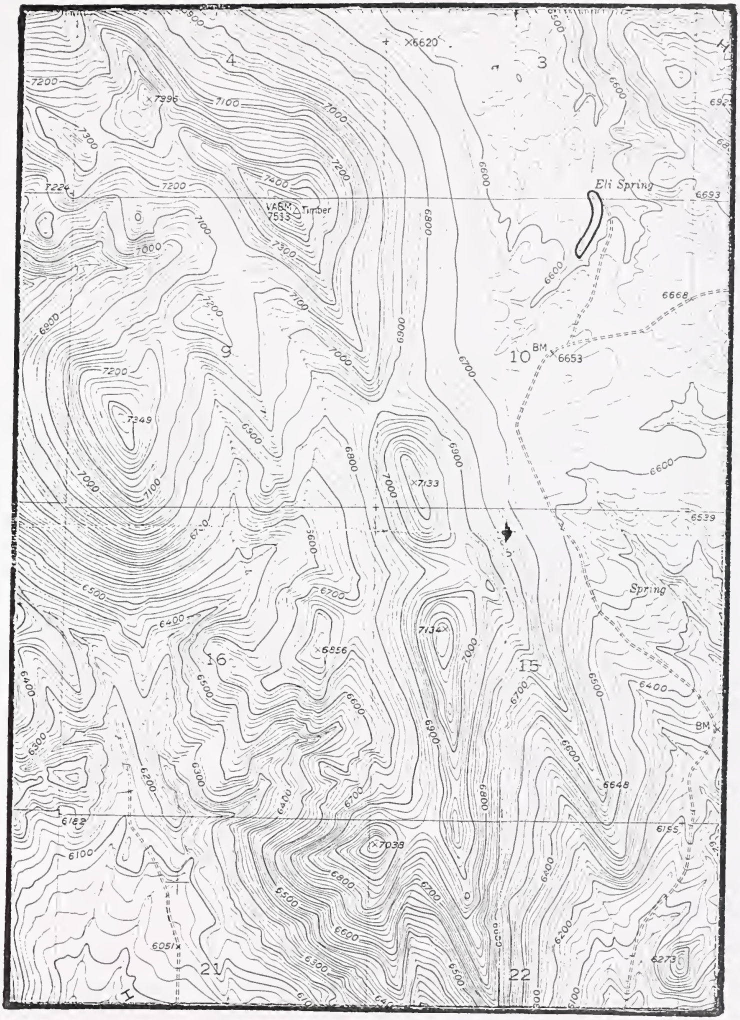
General site description:
WET MEADOW AT HEADWATERS OF SPRING-FED STREAM IN ROLLING SAGEBRUSH FOOTHILLS. LONG HISTORY OF LIVESTOCK GRAZING HAS PROMOTED FORMATION OF HUMMOCKS 0.5 M HIGH WITH TOPS DOMINATED BY JUNCUS BALTICUS AND MUHLENBERGIA RICHARDSONIS, AND INTERVENING TRENCHES DOMINATED BY CAREX AQUATILIS AND C. NEBRASCENSIS. THE SPECIES IS ON CRESTS OF HUMMOCKS WITH HIERACIUM GRACILE, TRIFOLIUM LONGIPES, ANTENNARIA SPP., AND CREPIS SPP.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
HEAVILY TRAMPLED BY LIVESTOCK, FORMING LARGE HUMMOCKS.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (1351). 1995. MONT.


4
3
×6620
7200
×7996
7100
7000
7300
7224
7400
VABM 7513
Timber
Eli Spring
6693
6668
6600
9
10
BM ×6653
7349
×7133
6539
Spring
7134×
×6856
16
15
6400
BM
6648
6182
×7038
6155
6100
6051×
21
22
6273

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LESQUERELLA PULCHELLA
Common Name: BEAUTIFUL BLADDERPOD

Global rank: G2 Forest Service status: SENSITIVE
State rank: S2 Federal Status:

Element occurrence code: PDBRA1N250.003
Element occurrence type:

Survey site name: BANNACK
EO rank: A
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
008S	011W	05	SW4NW4, NW4SE4; 4 NW4SW4; 6 NE4SE4

Precision: S
Survey date: 1994-06-12 Elevation: 6200 - 7000
First observation: 1992-06-25 Slope/aspect: 15-25% / WSW, SW, W
Last observation: 1995-06-14 Size (acres): 5

Location:
DIRECTLY NORTHEAST ABOVE BANNACK TOWNSITE, ON RIDGE COMPLEX EAST OF HANGMAN'S GULCH.

Element occurrence data:
1995: OCCURRENCE EXPANDED ON ADJOINING RIDGE. ABSENT OR UNCOMMON ON HARSH EXPOSED SETTINGS, RESTRICTED AND LOCALLY COMMON ON PART OF SIDE RIDGE SET BACK FROM GRASSHOPPER CREEK VALLEY. WAIF INDIVIDUALS OCCUR IN OPEN STREAM COURSE SPOTS. 1994: 1000+ PLANTS, 80% IN FRUIT, 20% VEGETATIVE. IN THE DROUGHT YEAR OF 1992, ONLY 9 PLANTS COULD BE FOUND, ALL IN LATE FRUIT 1992-06-25.

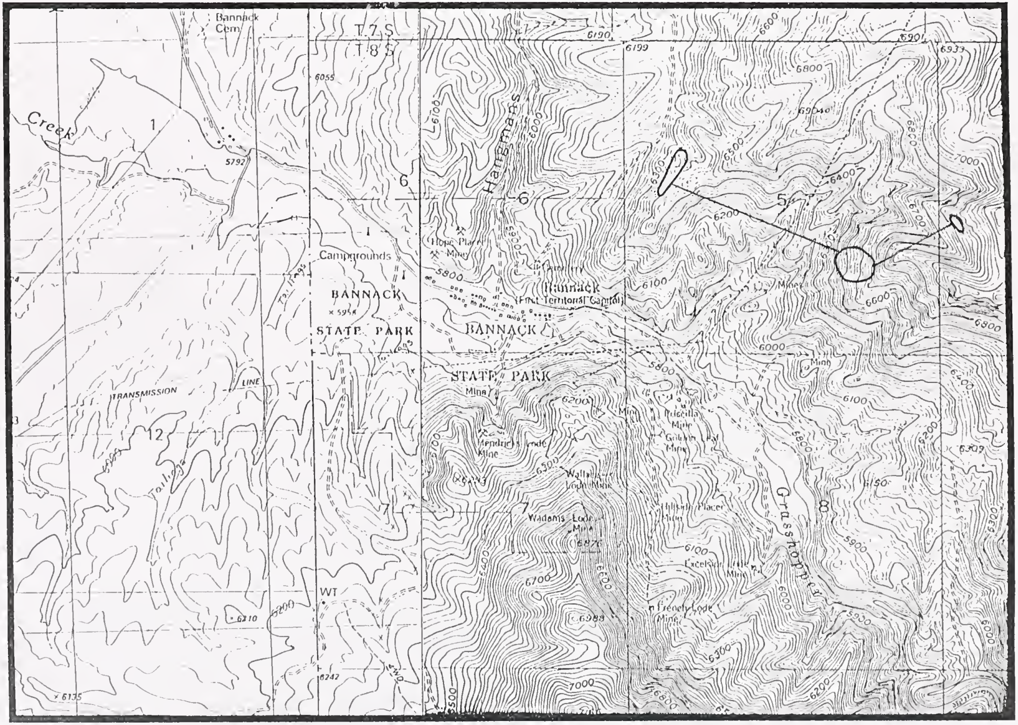
General site description:
LONG, STEEP, OPEN PRAIRIE SLOPE BELOW RIDGETOP, SHALLOW GRAVELLY CLAY SOIL. ASSOCIATED SPECIES: CERCOCARPUS LEDIFOLIUS COMMUNITY. IN AGROPYRON SPICATUM-ARTEMISIA TRIDENTATA ASSOCIATION, WITH LINUM LEWISII, HAPLOPAPPUS ACAULIS, ARTEMISIA FRIGIDA, ALLIUM TEXTILE, CAREX ROSSII, MIMULUS SUKSDORFII, ARENARIA KINGII, LOMATIUM ATTENUATUM. INCLUDES AREAS OF FROST HEAVE BUT NOT WITH BURROWING ACTIVITY.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
OBSERVED IN 1995 BY B. HEIDEL.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (706). 1992. !REED ROLLINS.
VANDERHORST, J. (5186). 1994. MONT.


Bannack Cem
T 7 S
T 8 S
Creek
Hangmans
Campgrounds
Hope Placer Mine
BANNACK
STATE PARK
Bannack (First Territorial Capitol)
BANNACK
STATE PARK
TRANSMISSION
LINE
Tailings
Hendricks Lode Mine
Wallace Lode Mine
Wadams Lode Mine
Priscilla Mine
Golden Leaf Mine
Hillside Placer Mine
Excelsior Lode Mine
French Lode Mine
Grasshopper
WT

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LESQUERELLA PULCHELLA
Common Name: BEAUTIFUL BLADDERPOD

Global rank: G2 Forest Service status: SENSITIVE
State rank: S2 Federal Status:

Element occurrence code: PDBRA1N250.006
Element occurrence type:

Survey site name: BADGER PASS
EO rank: A
EO rank comments: LARGE POPULATION.

County: BEAVERHEAD

USGS quadrangle: BANNACK

Township:	Range:	Section:	TRS comments:
007S	011W	27	NW4SE4, SW4NE4; 28 N2NE4

Precision: S
Survey date: 1992-08-05 Elevation: 6660 - 7200
First observation: 1992-08-05 Slope/aspect: 5-25% / SOUTH, SE, WNW
Last observation: 1995-06-14 Size (acres):

Location:
FROM HWY 278 AT BADGER PASS, TAKE UNPAVED MICROWAVE TOWER ROAD TO UNDEVELOPED ROAD SOUTH AND SOUTHWEST CA. 3 MILES. TOTAL POPULATIONS ARE LOCATED CA. 0.25 MILE TO THE SOUTHEAST, AND CA. 0.5 MILE TO THE NORTHWEST.

Element occurrence data:
1995: OVER 5000 PLANTS IN A FAVORABLE YEAR AND WITH EXPANSION OF OCCURRENCE BOUNDARIES OF THE LARGE SUBPOPULATION. IN FLOWER AND EARLY FRUIT 14 JUNE 1995. LOCALLY OCCASIONAL TO COMMON IN LIMITED AREAS.
1992: 500-1000 PLANTS; BUDDED AND ENTERING FLOWERING.

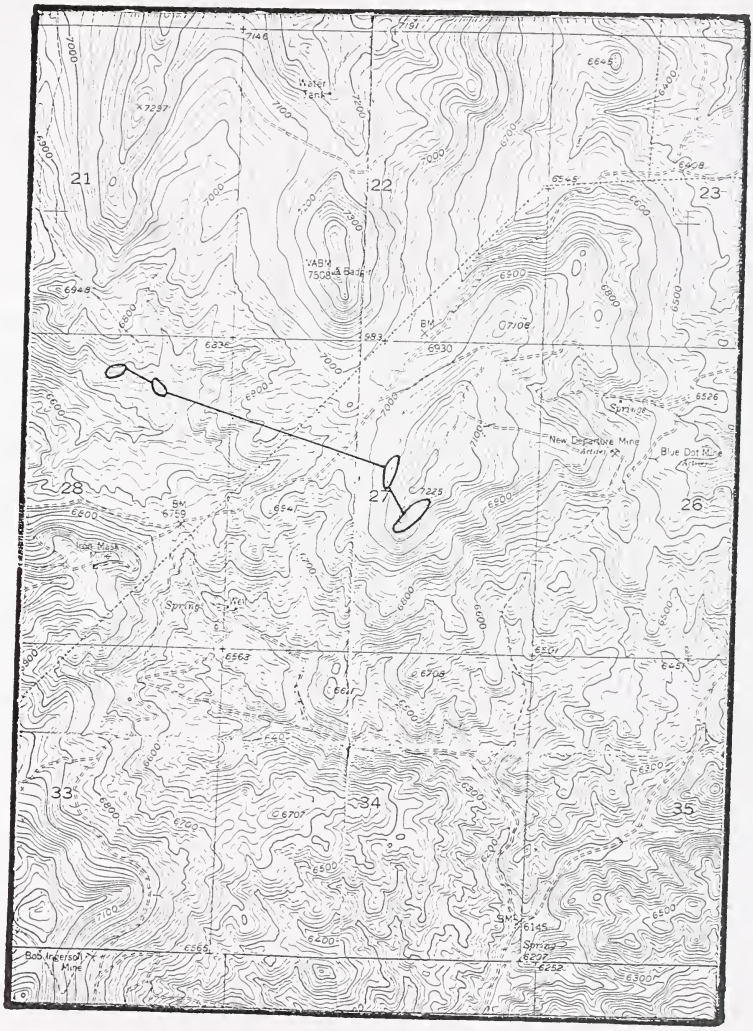
General site description:
TWO DISCRETE SETTINGS, WITH THE LARGE SUBPOPULATION AT SOUTH POINT OUTCROP OF PARTIALLY FORESTED RIDGE, ASSOCIATED WITH CERCOCARPUS LEDIFOLIUS, HYMENOXYS ACAULIS, ERIGERON TWEEDYI AND AGROPYRON SPICATUM. ALSO OCCURRING ON WEST-FACING UPPER SLOPE OF SAME RIDGE WITH FESTUCA IDAHOENSIS, ARENARIA KINGII, DRABA OLIGOSANTHES. SMALLER SUBPOPULATION IS ON OPEN MIDSLOPE OUTCROP IN BARRENS ZONE MAINLY ABOVE CERCOCARPUS, WITH HYMENOXYS ACAULIS, GUTIERREZIA SAROTHRAE AND ERIGERON TWEEDYI.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
NEW DEPARTURE MINE ELSEWHERE ON THE RIDGE SIGNIFIES POTENTIAL THREAT. THE IRON MASK MINE TO THE SOUTH IS AFFECTING SIMILAR HABITAT.

Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens: HEIDEL, B. (938). 1992. !REED ROLLINS.
HEIDEL, B. (1342). 1995.


Water Tank
VABM 7508
Spring
New Departure Mine
Blue Dot Mine
Rob Mack
Spring
Bob Ingerson Mine
21
22
23
26
27
28
33
34
35

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LESQUERELLA PULCHELLA
Common Name: BEAUTIFUL BLADDERPOD

Global rank: G2 Forest Service status: SENSITIVE
State rank: S2 Federal Status:

Element occurrence code: PDBRA1N250.009
Element occurrence type:

Survey site name: ROCKY HILLS
EO rank: A
EO rank comments: LARGE, PRISTINE POPULATION.

County: BEAVERHEAD

USGS quadrangle: GRANT

Township:	Range:	Section:	TRS comments:
009S	012W	1	NE4

Precision: S
Survey date: 1994-06-29 Elevation: 7000 - 7320
First observation: 1994-06-29 Slope/aspect: 20-30% / SW
Last observation: 1994-06-29 Size (acres): 15

Location:
CA. 5 MILES NORTH OF GRANT ON GRAVEL ROAD CONNECTING HWY 91 TO BANNACK STATE PARK; TURN EAST ON DIRT ROAD, PASS ROCKY WELL, FOLLOW ROUGH 4-WHEEL DRIVE ROAD TO JUST BELOW RIDGETOP OF ROCKY HILLS.

Element occurrence data:
1000-10,000 PLANTS, 100% IN FRUIT. EVIDENCE OF FRUIT DISPERSAL.

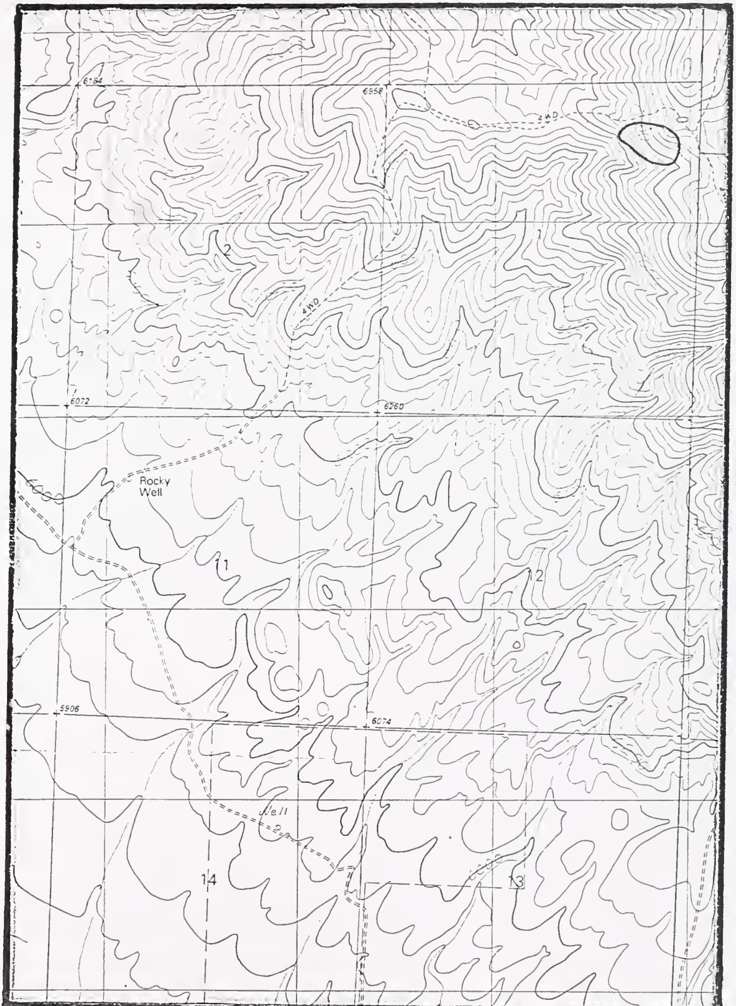
General site description:
DRY, OPEN RESIDUAL UPPERSLOPE. LIMESTONE PARENT MATERIAL, GRAVELLY CLAY SOIL. ASSOCIATED SPECIES: PINUS FLEXILUS, ARTEMISIA TRIDENTATA, CERCOCARPUS LEDIFOLIUS, ELYMUS SPICATUS, PENSTEMON ARIDUS, CASTILLEJA PALLESCENS, SENECIO CANUS, HAPLOPAPPUS ACAULIS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
PRIMITIVE ROAD TO POPULATION.

Information source: VANDERHORST, J. [BOTANIST]. 1515 LAKE STREET, OGDEN, UTAH 84401.

Specimens: VANDERHORST, J. (5209). 1994. MONT.


6164
6958
4WD
2
4WD
6072
6260
Rocky
Well
11
12
5906
6074
Well
14
13

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LESQUERELLA PULCHELLA
Common Name: BEAUTIFUL BLADDERPOD

Global rank: G2 Forest Service status: SENSITIVE
State rank: S2 Federal Status:

Element occurrence code: PDBRA1N250.010
Element occurrence type:

Survey site name: ERMONT GULCH
EO rank: C
EO rank comments: LIMITED POPULATION AND HABITAT SIZE.

County: BEAVERHEAD

USGS quadrangle: ERMONT

Township:	Range:	Section:	TRS comments:
006S	011W	34	SE4SE4; 35 SE4SW4

Precision: S
Survey date: 1995-06-14 Elevation: 6500 - 6800
First observation: 1995-06-14 Slope/aspect: 5-20% / NNW
Last observation: 1995-06-14 Size (acres): 1

Location:
CA. 14 MILES WNW OF DILLON. FROM DILLON, TAKE HWY 91 CA. 3.5 MILES SOUTH TO BADGER PASS EXIT. GO CA. 6.5 MILES WEST TO ERMONT GULCH ROAD. TAKE THIS ROAD CA. 7 MILES NORTHWEST. PRIMARY POPULATION IS SOUTH OF ROAD.

Element occurrence data:
OVER 100 PLANTS IN UPPER AND LOWERSLOPE POSITIONS, WITH ACCIDENTAL SUBPOPULATION OF FEWER THAN 30 PLANTS ON ABANDONED ROAD. IN FLOWER 14 JUNE 1995.

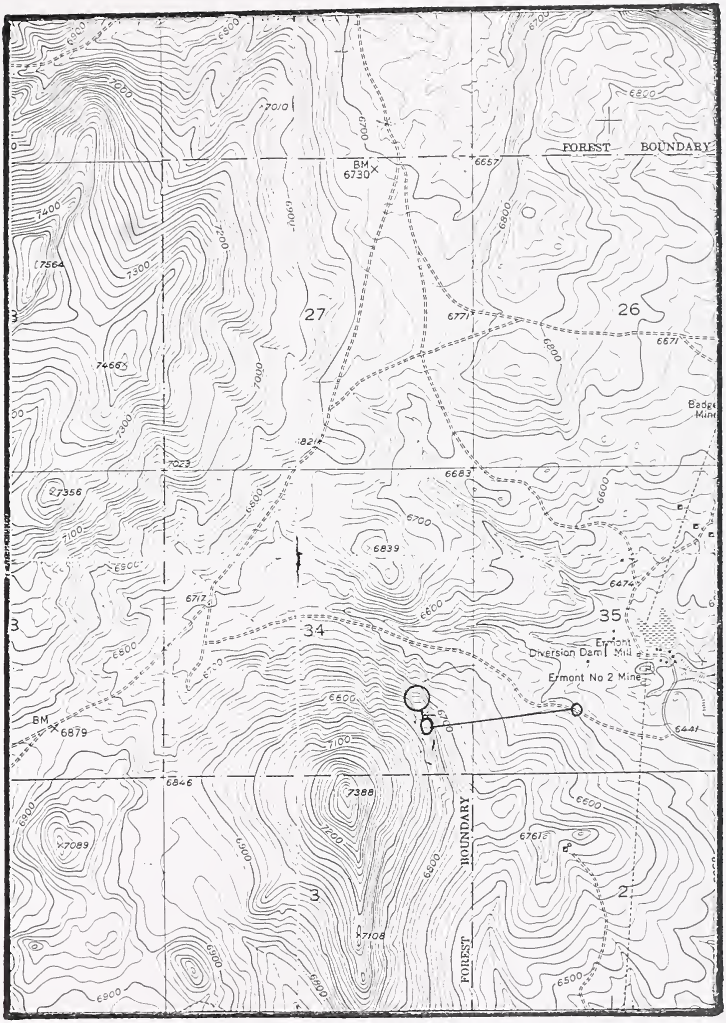
General site description:
UPPER AND LOWERSLOPE POSITIONS OF SMALL NNW-FACING LIMESTONE OUTCROP ASSOCIATED WITH LARGE IGNEOUS RIDGE. DOMINATED BY ARTEMISIA TRIDENTATA AND FESTUCA IDAHOENSIS, ASSOCIATED WITH DOUGLASIA MONTANA, HAPLOPAPPUS ACAULIS, ERIGERON COMPOSITUS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SITE CURRENTLY PASTURED; POSSIBLE TRAMPLING IMPACT AT LOWERSLOPE POSITION.

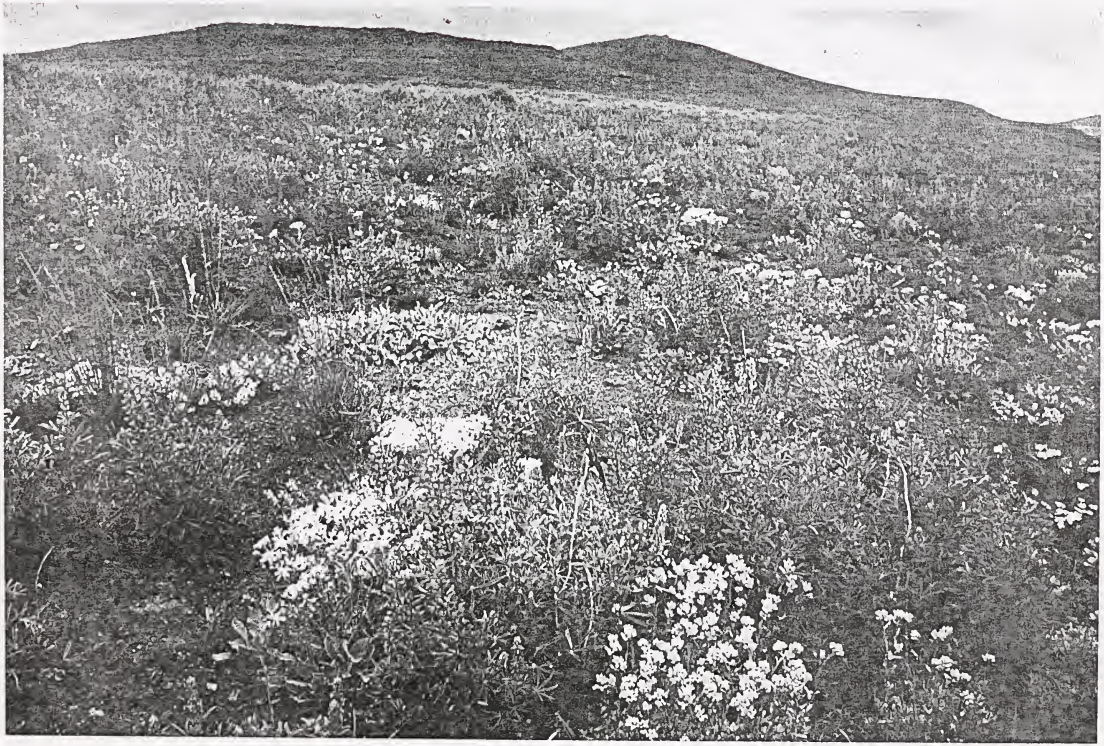
Information source: HEIDEL, BONNIE. [BOTANIST] MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVENUE, P.O. BOX 201800, HELENA, MT 59620-1800. WORK: 406/444-3009.

Specimens:


FOREST BOUNDARY
BM 6730
6657
7010
7564
7400
7300
7466
27
26
6771
6671
Badger Mine
6821
7023
6683
7356
6839
6474
6717
34
35
Ermont Diversion Dam
Mill
Ermont No 2 Mine
BM 6879
6441
6846
7388
7089
6761
3
2
7108
FOREST BOUNDARY

Appendix D. COLOR XEROXES OF SENSITIVE SPECIES AND THEIR HABITATS.

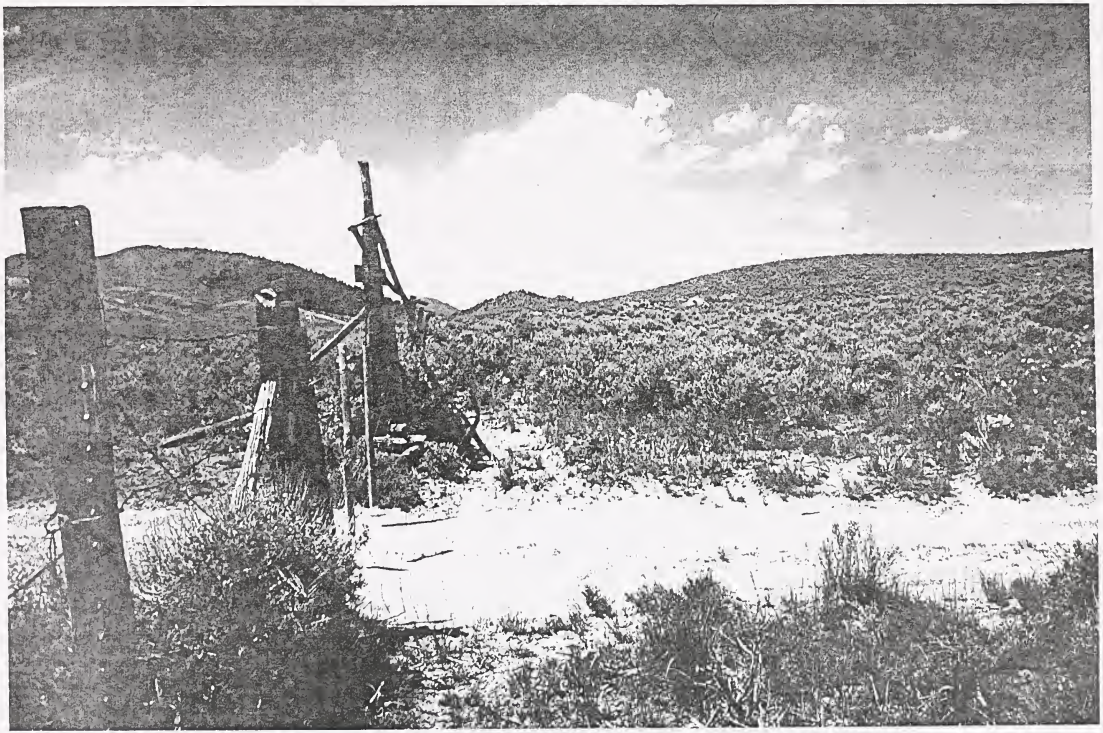
1. Astragalus platytropis in fruit - Browne's Gulch



2. *Astragalus platytropis* habitat on shallow soil - southeast of Melrose

3. Astragalus platytropis habitat threats - ORV use and knapweed encoachment from road along Camp Creek

4. Astragalus scaphoides flower and browsed infloresence (center) - Grasshopper Creek east of Bannack

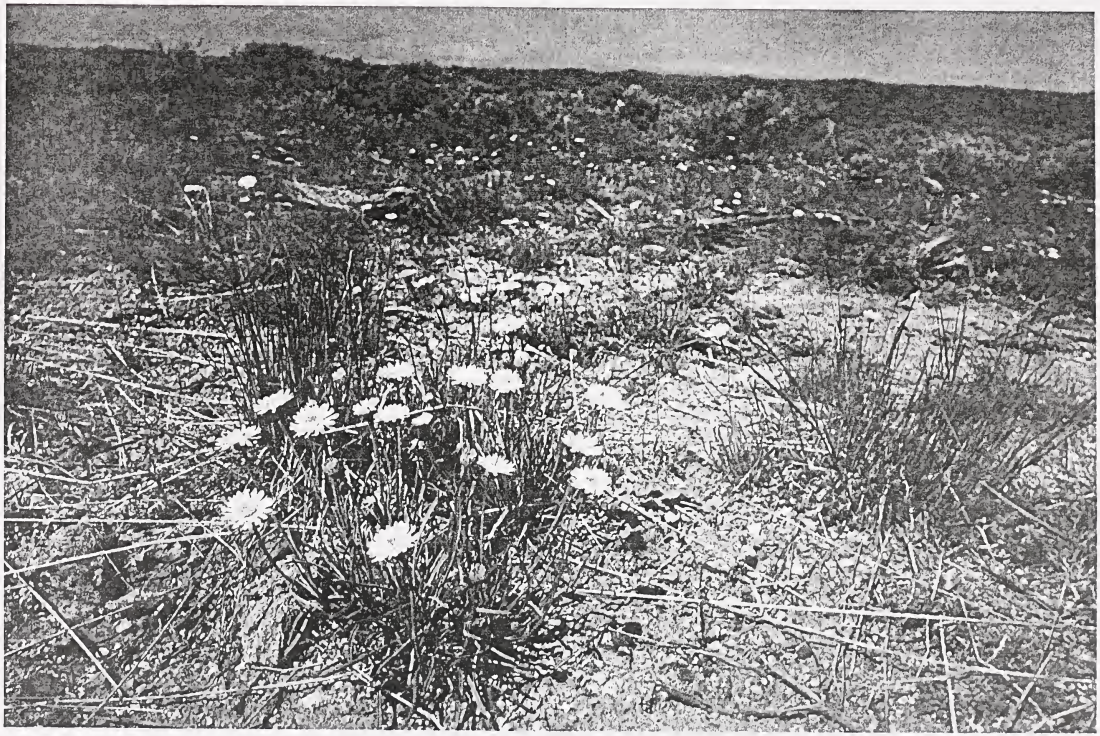


5. Astragalus scaphoides habitat - Clark Canyon School Section (left side) with low numbers in fair range condition and high numbers on BLM lands in good range condition

6. Astragalus scaphoides habitat - in low numbers under concentrated grazing along Cold Springs Creek bottom

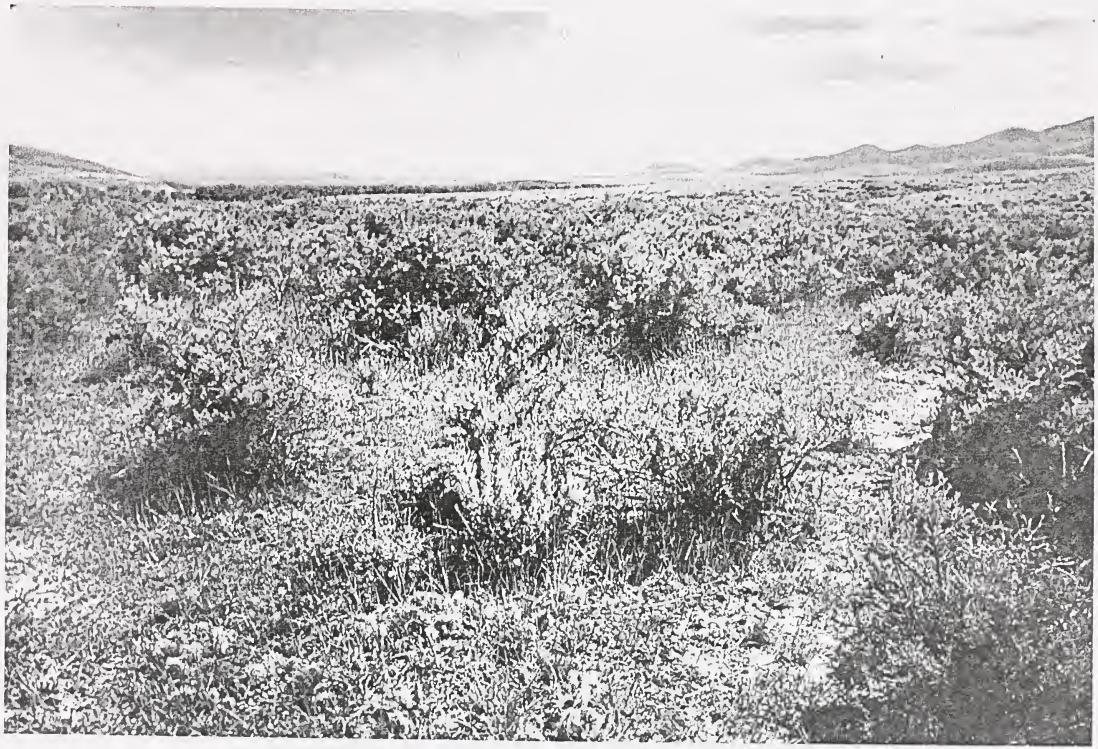
7. Astragalus terminalis in flower

8. *Astragalus terminalis* and *Stephanomeria spinosa* habitat (foreground and background terraces) in Upper Madison Valley



9. Erigeron linearis in flower - Ermont Gulch

10. Kochia americana in fruit - Browne's Gulch

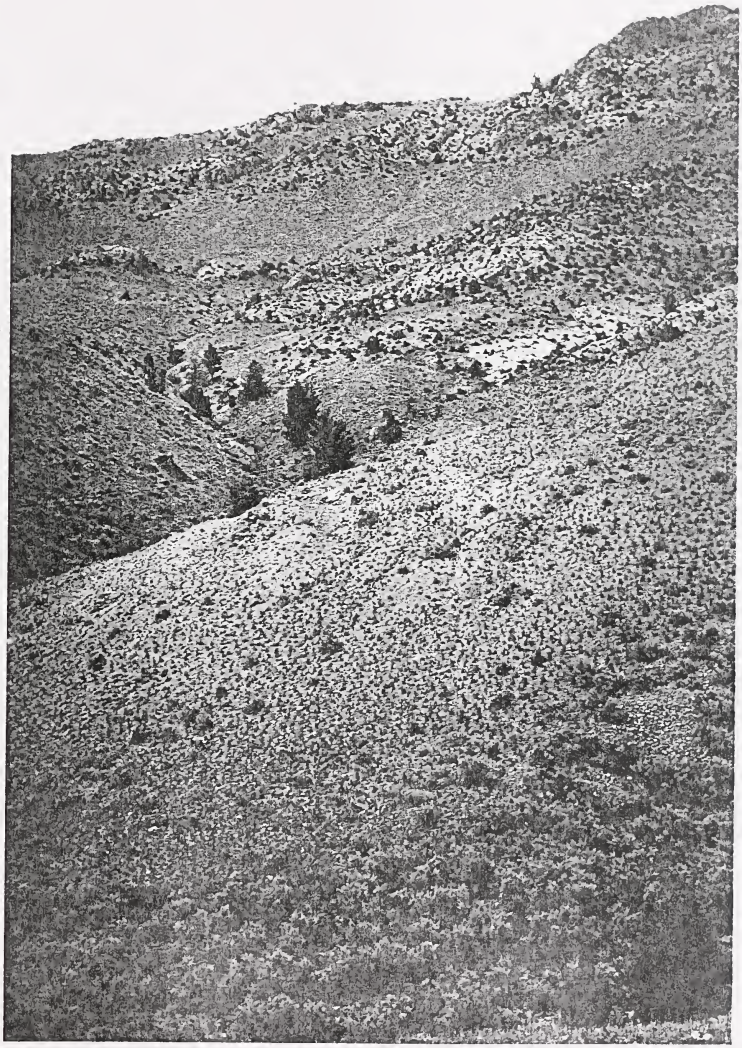


11. Kochia americana habitat - Browne's Gulch

12. Lesquerella pulchella in flower - Badger Pass

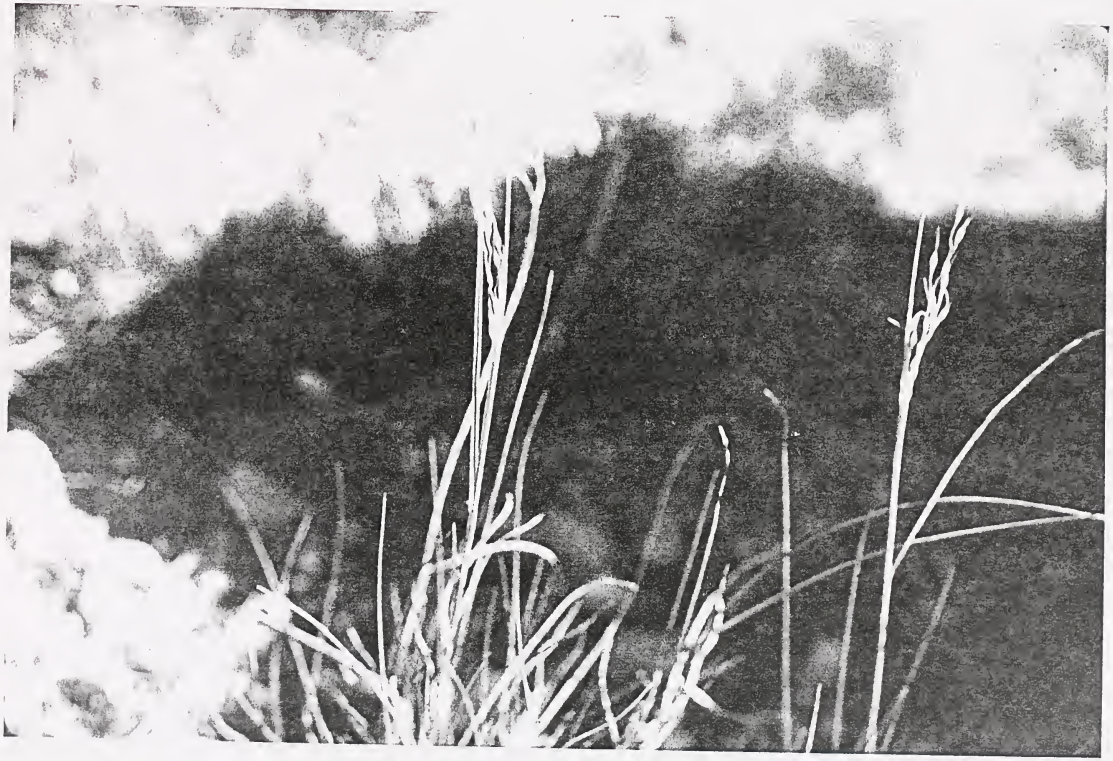
13. Lesquerella pulchella habitat - Badger Pass

14. Lomatium attenuatum in flower and fruit - east of Bannack



15. Lomatium attenuatum habitat in semi-mesic midslopes and *Astragalus scaphoides* habitat in lower foreground - east of Bannack

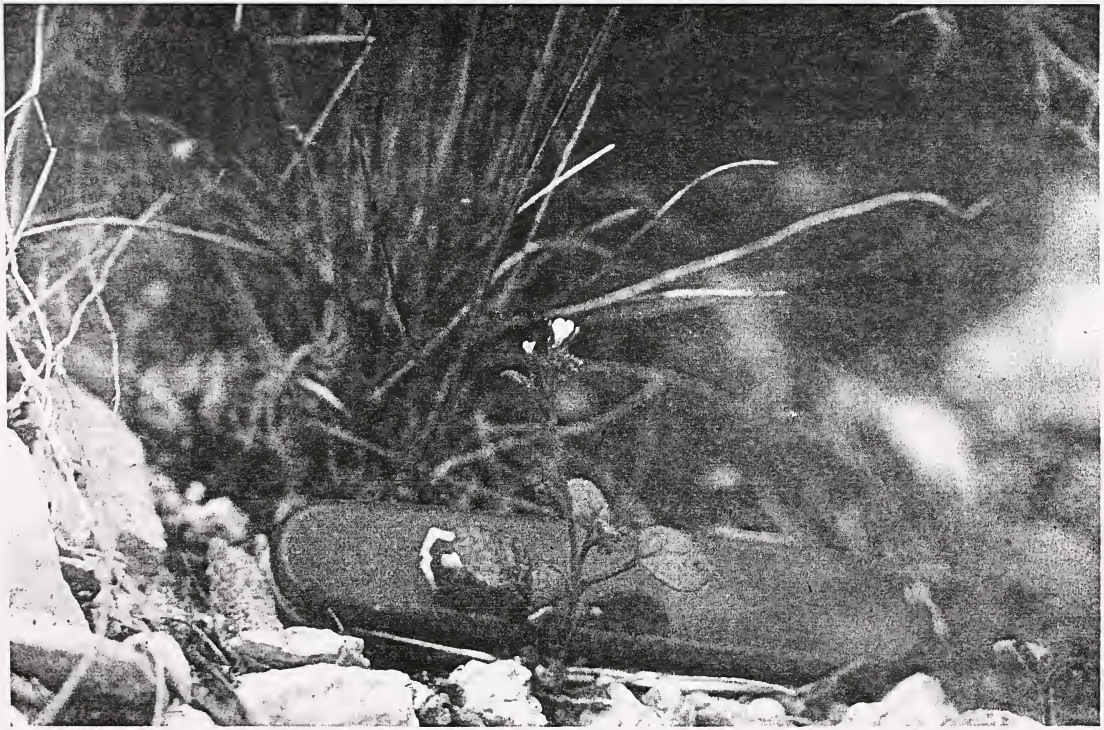
16. Oryzopsis contracta expanded infloresence - north of Clark Canyon Reservior



17. Oryzopsis contracta unexpanded inflorescence - north of Clark Canyon Reservior

18. Oryzopsis contracta habitat - north of Clark Canyon Reservior

19. Oryzopsis contracta habitat (foreground) - Bannack State Park



20. Phacelia incana in flower - east of Bannack

21. *Phacelia incana* habitat - east of Bannack

22. Sphaeromeria argentea in flower - Ermont Gulch

23. Sphaeromeria argentea habitat - Ermont Gulch

24. Sphaeromeria argentea habitat - south of Bannack

25. Stephanomeria spinosa in flower - Upper Madison Valley

26. Taraxacum eriophorum in flower - Eli Spring

27. Taraxacum eriophroum in fruit - Eli Spring

28. Taraxacum eriophorum habitat - Eli Spring

29. Townsendia nuttallii past flower - north of Badger Pass

30. Townsendia nuttallii habitat - Henneberry Ridge